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VOL. III. NO. 2

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THE COMMERCIAL CAR JOURNAL

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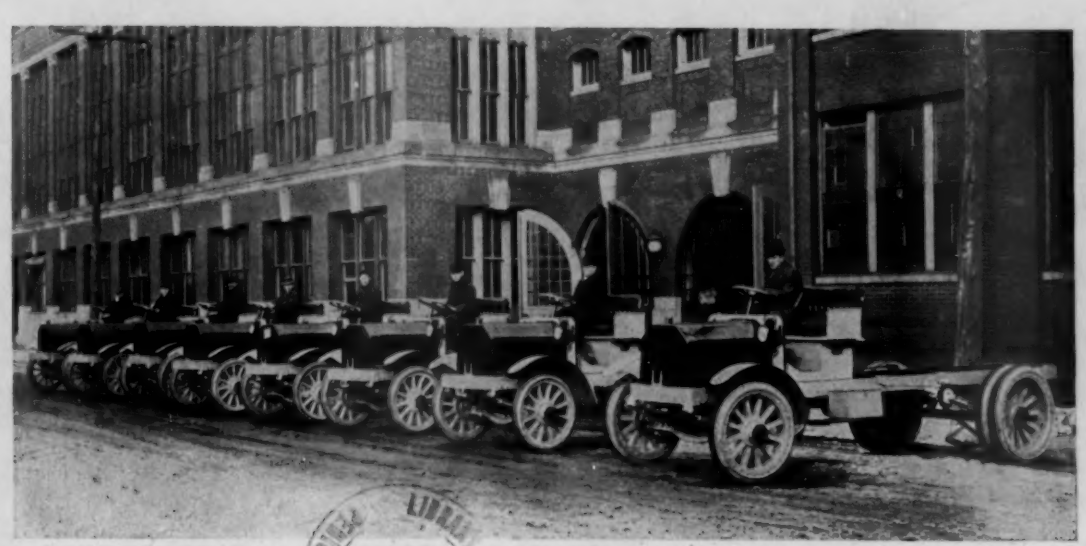

Eight of the sixteen Peerless Motor Truck chassis bought by the American Express Company, whose business demands uninterrupted service

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It was after thorough mechanical investigation that this company bought its first five Peerless Motor Trucks. The uninterrupted service given by those trucks in every-day use has since led to the purchase of eleven other **Peerless Trucks by the same company.**

This and other instances show that Peerless Trucks are being bought rather than sold. And they are bought with assurance. One of the Peerless principles is to place Peerless Motor Trucks only where individual conditions point clearly to the user's profit.

Peerless 3-Ton 4-Ton 5-Ton MOTOR TRUCKS

Correspondence Solicited

TRUCK DEPARTMENT

The
Peerless Motor Car Company
Cleveland

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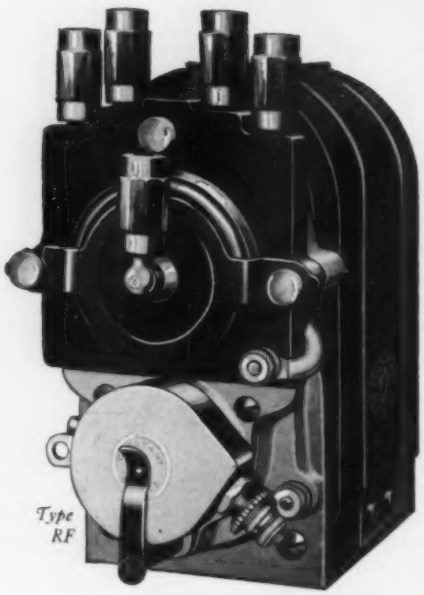

Type RF

Trucks and Tractors

Present Special Problems

Solid rubber or steel tires produce shocks that are fatal to the delicate mechanism of the ordinary magneto. The low speed required in heavy hauling also demands a non-failing white hot spark under continuous throttling down. The answer is the

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It combines simplicity with utmost efficiency. There are no revolving wires, no troublesome wiping contacts, no delicate springs to weaken and break; no frail parts of any kind; no intricate adjustments. Two laminated steel inductors revolve around a central stationary winding, generating the current, which is carried direct by wire from the winding. Highest grade ball bearings; chrome, nickel steel, the best platinum obtainable; indestructible bakelite insulation.

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As sturdy mechanically as it is efficient electrically.

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The country-wide Remy Service, with its trained ignition experts, is on the job all the time to keep your trucks free from ignition troubles.

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THE PUBLISHERS' PERSONAL PAGE

"NOT TO ADVANCE IS TO RECEDE."

Trucks Are Successful

only when intelligently handled.

Are you handling yours intelligently? Are you getting the most from your investment, or are you paying enormous repair bills and growling about the prohibitive cost of upkeep? We have letters from both kinds, but investigation always shows that dissatisfaction is due to poor business methods and ignorance of the first principles of commercial car operation.

A Brewing Company

says its first truck, during the first year, covered over ten thousand miles, averaging thirty miles per day, with a load of ten tons daily, displacing three teams. This company also uses other machines, averaging thirty to thirty-five miles a day, with from six to nine tons delivered per day. They say, "These trucks are used as much as possible in the country runs, the roads being very hilly, and about as rough as can be found in this section. Our trucks are the height of satisfaction to us, and truck performance is far superior to that of the horse."

You Can Get Results

just as well as other truck users, but you must know how. The necessary information can easily be had. Read the commercial car journals.

Don't Make the Mistake

so often made by others, of waiting until you already have commercial cars in service before subscribing for and reading a commercial car paper. The knowledge which will forewarn, forearm, and prevent trouble in the beginning, is worth many times any information which may be obtained after trouble has occurred. Study first and buy your trucks afterward.

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No Rip Van Winkle ever slept
More soundly than the maker
Who said that advertising was
The magic of a faker.

For advertising is the art
Of spreading through the land, sir,
That what you've got all ought to get,
And thereby hangs the answer.

Keep Up To Date

After the cars are in service the same thing is still true, and satisfaction cannot be had unless those in charge are not only posted, but keep literally up to date on the subject. This can be done by a few, by experience and keeping their eyes open as to what is being done by others, but at best the knowledge thus gained is very local in character. A broad view of the situation can only be had by reading the current literature on the subject.

Do It Now

Now is the time for you to begin; the subscription price is but $2 a year, acceptable in any form at our risk.

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"Used in every line of Business"

Autocars have gained the confidence of the leading concerns of the country, many of whom have extended their delivery service 50% by their use. Begin your motor delivery service with a car that is endorsed by every owner. Write for list of users and Catalog No. 4-C.

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The Commercial Car Journal

VOLUME III | PHILADELPHIA, APRIL 15, 1912 | NUMBER 2

CHICAGO MAKES FIRST MOVE FOR COMMERCIAL CAR SHOW IN THE FALL

The Chicago Automobile Trade Association has made a move to bring about a National Show of commercial motor cars in the fall. President N. H. Van Sicklen, of the Association, and Henry Paulman, chairman of its show committee, have made application for a sanction for such a show, through Samuel A. Miles, General Manager of the National Association of Automobile Manufacturers. It is proposed to hold the show in the Coliseum Building in Chicago. No date has been set and nothing definite will be decided upon until it is ascertained whether or not the N. A. A. M. will sanction such a show, and also whether the building can be secured. S. A. Miles has control of the building as far as automobile shows are concerned. The proposed show is to be held in addition to the annual shows already announced.

SUMMER MEETING OF THE SOCIETY OF AUTOMOBILE ENGINEERS

In response to cordial invitations received from the Mayor of Detroit, the S. A. E. Detroit Section, the Wolverine Automobile Club and the Detroit Board of Commerce, the 1912 summer meeting of the Society will be held in Detroit, June 27, 28 and 29. The memories of previous meetings in Detroit are most pleasant, and there is every reason to believe that the one this summer will be even more successful. The meeting will include inspection of factories as heretofore.

The following papers among others will probably be presented at the various professional sessions of the meeting:

Long and Short Stroke Motors—By John Wilkinson.

Worm and Gear Drive Data—By Chester S. Ricker.

Wire Versus Wood Wheels—By John Pugh.

Standardization of Drawings—By George W. Dunham.

Reports from several of the Divisions of Standards Committee will be submitted.

NEW YORK MOTOR-TRUCK PARADE

The annual motor truck parade of the Motor Truck Club Saturday afternoon, April 13, was the largest turnout of motor trucks ever seen in any city. Not less than 300 trucks were in line. The parade was a "one-way" affair, rather than a circuit. There were many practical reasons for this which will be appreciated by business houses as well as by the trade. The start was changed to the Battery and the hour for the start changed to 1.30 o'clock. This meant that the line of trucks passed through a large part of the downtown business district, where motor truck missionary work does the most good, at an hour when much business was still in operation and where the lessons of truck transportation were effective. Besides, it was at such an hour that concerns having motor deliveries of their goods to make for up-town and Harlem could load their trucks, put them into the parade and reach the end of the route in time to make practical deliveries within up-town business hours.

Commercial Car Parade Forming. Start of the trucks from the Battery, N. Y.

The parade formed at the Battery and moved up Broadway, swerving off at the theater district to prevent congesting the traffic, thence to 125th Street, where the line was dismissed. E. W. Curtis, Jr., of the General Vehicle Company, was chief marshal. Unfortunately the management failed to get a special parade permit and as a result the line was broken up and separated at points by several blocks.

MASSACHUSETTS TO LIMIT WEIGHT AND SPEED OF TRUCKS

A bill has been introduced into the Massachusetts legislature which limits the weight and speed of commercial motor cars which may use the roads and bridges of that state. The bill limits the weight of vehicle and load which may pass over a bridge in a town or village to six tons, and it limits those which may pass over bridges in cities to twelve tons. No vehicles in excess of this weight will be permitted to use the public highways unless by special permit from the town, county, state or city authorities having control. The bill also limits the speed of trucks having a total weight of from four to eight tons to ten miles per hour, and those in excess of eight tons to eight miles per hour. The bill also fixes the width of the tire by providing that no load shall be over 800 lbs. to an inch width of tire. The license fee has been changed from the flat rate of $5 per car to a graduated rate starting at 30 cents per h. p. for small cars up to 19 h. p., and ending with $1 per h. p. for trucks of 50 h. p. or over.

THE SOCIETY OF AUTOMOBILE ENGINEERS will move on May 1st from their present offices, 41st Street and Broadway, to the 12th floor of the new U. S. Rubber Company's building, Broadway and 58th Street. The new offices will be very commodious, having 1500 sq. ft. of floor space.

Stampede For Motor Fire Apparatus Unabated

City and Town Officials Desirous of Having the Benefits of Motor Fire Trucks Recognized

The immense demand for motor fire apparatus which has been mentioned several times in these columns continues unabated throughout the entire country, and, in fact, seems to be growing more general daily. There is no doubt but that the two main reasons for this are the low cost of maintaining motor fire apparatus as compared with horse apparatus, and the great saving of property resulting from the motor apparatus reaching fires more quickly than horses. This latter fact is forcibly illustrated by the following extracts from the Kansas City, Mo., Journal, of March 24th, 1912:

Automobile Apparatus For Fighting Fire Demonstrates Superiority

The superiority of motor fire apparatus over horse-drawn apparatus was demonstrated at two fires which occurred about noon yesterday in the outlying districts of Kansas City, Kas. An alarm at Twenty-sixth Street and Parallel Avenue was followed closely by one at 1234 Rowland Avenue. Chief Jack McNarrey's car and the combination hose and chemical truck from headquarters at the city hall made the run to both fires.

"If we had to depend on horse-drawn apparatus both houses would have been consumed before we could have even reached them even had we been lucky enough to reach them at all," Chief McNarrey said last night. "The new truck is a regular snow plow. It tore right through the deep snow where a horse drawn truck could not have gone faster than a walk. The second alarm followed closely on the first, and a team that had made the first run would have been so 'winded' that it could hardly have answered the second call."

The loss on the houses, both small frame structures, was held down, despite the difficulty of access, to $200 on the first and $600 on the second.

The economy of the motor fire apparatus as compared with horse apparatus is also illustrated by the extract which we give below from the Springfield, Mass., Republican, March 28, 1912:

BIG TRUCK COSTS SIXTY DOLLARS A YEAR

Electric Fire Ladder Truck Has Been in Service Twelve Months

The big $10,000 electric ladder truck of the fire department, housed at Courtstreet station, passed on Monday its first anniversary in the service of the department. It was put into commission March 25, 1911, and since that time has been in constant service. It is no mistake to say that the fire commission and the officials of the department are well pleased with the work it is doing. The truck has answered 118 alarms since it went into commission, and its use has cost the city less than $60. It apparently will be in condition for use many years to come without much greater annual expense. The old truck, drawn by three horses, was maintained at an annual expense of about $1000, the largest part of which was spent on the horses. The chief item of cost of maintaining the electric truck is the replacing of the batteries, and how long these will last without being replaced remains to be seen. They are about two years old now, as they were manufactured nearly a year before the truck went into commission.

To show the immense demand for this apparatus, we give you below some items which are in addition to those we published last month and are only the small percentage of similar instances throughout the country.

ARKANSAS.

Fort Smith.—Bids have been asked on a motor fire wagon.

Little Rock.—Board of Public Affairs have advertised for bids on four new motor fire wagons.

CALIFORNIA.

Hollywood.—Supply Committee instructed to purchase motor fire engine.

San Francisco.—Chief Murphy stated that while San Francisco was slow making a start, it will not be long before the entire department will be motorized.

GEORGIA.

Macon.—Councils fire committee are planning to buy two more motor engines and a hook and ladder.

COLORADO.

Longmont.—The city council is considering the purchase of an auto fire truck to replace their present fire wagon team.

Anderson.—The council committee has been appointed to cooperate with the fire chief to investigate the proposition of buying an auto fire truck.

Bluffton.—The council committee attended the auto show for the purpose of inspecting the auto fire trucks, which they will consider purchasing.

New Albany.—Board of Public Safety, city council and mayor will have a meeting to consider the purhase of a motor fire truck.

CONNECTICUT.

New Britain.—Chairman J. E. Callahan has outlined a plan to substitute motor apparatus for all the horse-drawn fire apparatus by an expenditure of $50,000.

ILLINOIS.

Chicago.—The Fire Department have asked for sealed proposals on ten motor driven fire wagons.

Freeport.—City council has authorized the issuance of $28,000 in bonds for the purpose of building a new fire station and the purchase of motor fire apparatus.

IOWA.

Dubuque.—The Fire Committee has advertised for bids on motor apparatus.

MARYLAND.

Arlington and Pikesville each have sent delegates to petition the county commissioner to purchase auto trucks in their respective neighborhoods.

MASSACHUSETTS.

Braintree.—Town committee on March 15th voted for the purchase of a combination motor fire truck.

Framingham.—A $5,000 motor fire engine will be bought for the central fire house.

Pittsfield.—Chief Shepard has made a strong argument for a motor driven fire truck.

Springfield.—At a town meeting on March 28th an appropriation of $5,000 was made for the purchase of an auto fire truck.

Stoneham.—Town meeting held March 27th voted $5,900 for the purchase of an auto fire truck.

Waltham.—A town meeting was called to consider the advisability of buying an auto fire truck.

Watertown.—A town meeting held March 14th appropriated $6,000 for the purchase of a combined motor truck.

West Springfield.—An appropriation of $5,000 has been voted for the purchase of a new motor truck for the fire department.

Worcester.—The commissioner for the fire department has recommended the purchase of four pieces of motor apparatus.

Attleboro.—Town meeting appropriated $5,000 for combination ladder truck to be used by Hose Company No. 4.

Cambridge.—Councils committee on finance has recommended the purchase of two motor fire wagons and one motor ambulance.

North Andover.—Fire committee recommends the purchase of a combination motor fire and ladder truck.

South Framingham.—A proposition to appropriate $6,000 for the purchase of a motor combination fire wagon will be submitted to the voters.

MINNESOTA.

Minneapolis will complete the first fire station especially designed for housing motor fire apparatus at Nicoin Avenue and 46th Street.

Rochester.—The city has purchased a combined automobile chemical engine at a cost of $9,000.

MISSISSIPPI.

Jackson.—City council and the Board of Fire Commissioners are arranging for the purchase of a motor chemical engine.

NEBRASKA.

Benson.—The City is planning to equip the entire fire department with motor apparatus.

NEW JERSEY.

East Orange.—Fire Board have asked council to buy a motor fire truck and also a roadster for the fire chief.

Newark is considering the purchase of two motor fire patrols.

Perth Amboy.—Board of Aldermen are considering the purchase of a motor fire apparatus of the Protection Hook and Ladder Company.

NEW HAMPSHIRE.

Concord is considering the purchase of a $4,000 combined motor fire patrol.

Portsmouth.—Mayor Badgor is urging the purchase of a motor chemical and hose wagon.

NEW YORK.

Dobbs-Ferry.—Town meeting appropriated $6,000 for a combination motor fire wagon for the Livingston Hose Company.

New Rochelle.—Bids have been advertised for a 700-gallon combination pumping engine and hose wagon.

Olean.—Chief Rogers is urging the city council to purchase additional motor fire apparatus.

New York City.—Commissioner Johnson opened bids on April 1st for twenty-six auto combination fire and hose wagons and three high pressure motor hose carts.

OHIO.

Canton.—Finance Committee have voted a $70,000 bond issue for motor fire equipment.

Findlay.—The Safety Department will either purchase new motor driven fire apparatus or convert their present horse-drawn equipment by applying motor chasses to them.

Lakewood.—Sealed bids have been asked for on a combination chemical and pumping motor fire engine.

Norwalk.—Councils authorized a $10,000 bond issue for the construction of a motor fire station and purchase of motor equipment.

Youngstown.—The council has authorized the issuance of $70,000 in bonds for the purpose of purchasing motor apparatus for the entire Fire Department.

Columbus.—Fire department has decided to do away with the horse and use motors only in the future; $50,000 has been appropriated for the purpose.

OREGON.

Baker City.—Commissioner Henry urgently advocates a new motor fire truck.

PENNSYLVANIA.

Meadville.—City council has authorized the purchase of a motor fire engine to cost between $6,000 and $7,000.

Philadelphia.—Geo. D. Porter, Director of Public Safety, on March 29th appointed three experts to investigate the merits of motor fire trucks and arrange for the purchase of a number of combined fire trucks within the next three months.

Wilkinsburg.—City clerk has asked for bids on an automobile fire truck.

RHODE ISLAND.

Providence.—Warwick & Coventy section fire district are to be supplied with an automobile fire truck.

TEXAS.

Galveston.—Bids have been asked for a combined motor truck.

UTAH.

Salt Lake City.—A combined chemical and hose wagon will be installed during the next month.

VERMONT.

Montpelier.—Council is investigating the purchase of motor fire wagons.

WASHINGTON.

Tacoma.—Truck Company No. 6 has been completely motorized. Truck Company No. 1 has a new motor truck, and the entire department will be motorized as quickly as possible.

Everett.—Fire commissioners and citizens are endeavoring to raise money for the purchase of fire apparatus.

WISCONSIN.

Appleton.—Councilman Goodland and Fire Chief McGillen are investigating motor fire apparatus and will urge its purchase.

BUSINESS TROUBLES

CORTLAND WAGON COMPANY, Pittsfield, Mass., scheduled in bankruptcy, show liabilities of $20,636 and assets, $13,798.

AUTO EXPRESS COMPANY, Paterson, N. J., Walter R. Hudson, receiver, announces the assets $128.53 and liabilities $18,252.03.

THE MOTOR WAGON COMPANY, of Detroit, Mich., at a meeting of the creditors, at which 70 per cent. of the total indebtedness was represented, was granted an extension. A committee of three of the largest creditors was appointed to secure the signatures of all the creditors. The company has orders in hand for a large number of cars, and prospects are great for a very active season. Its difficulties were due to too great an expansion of business for its working capital.

FINDLAY MOTOR COMPANY, Toledo, O., in bankruptcy. An order has been applied for to have the assets of the company sold to satisfy the claims of creditors and to liquidate two receivers' certificates. The claims against the receiver amount to $10,381.

WYCKOFF, CHURCH & PARTRIDGE, INC., New York City, makers of the Commer truck, are still operating under receiver Sheppard, and as sales and deliveries of trucks are being made rapidly, it is expected that a re-organization will be consummated with additional working capital.

PERSONAL MENTION

CHAS. W. GARRATT, formerly with the American Radiator Company, has been elected secretary and treasurer of The Federal Motor Truck Company.

CHARLES MEASURE has been appointed manager of the motor truck tire department of the Federal Rubber Manufacturing Company, Milwaukee, Wis.

CLARENCE M. ROGERS has become sales manager for the Bowling Green Motor Car Company, Bowling Green, O., maker of the Modern delivery wagons.

GEORGE L. SULLIVAN, traveling representative for the Alco Company, has been appointed supervisor of the Alco branches in Chicago, Boston and Montreal.

R. G. HOWARD, Grove City, Pa., formerly of the Autocar Company's sales department, is now resident manager of the Bessemer Motor Truck Company's office and salesrooms, 903 Boylston Street, Boston, Mass.

A. M. LAYCOCK, formerly with the A. O. Smith Company, and the English Daimler Company, has been engaged as chief engineer of the automobile axle department of the Sheldon Axle Company, Wilkes-Barre, Pa.

C. W. MARTIN, former manager of Atlanta, Ga., branch of the Goodyear Tire & Rubber Company, has been promoted to the management of the motor truck tire department of the company, and headquarters will be at Akron, O.

J. D. MAXWELL, president Maxwell-Briscoe Motor Company and vice-president of the United States Motor Company, has been absent for many months on account of illness, but has now returned to his post, much to the gratification of his associates.

Broad Street, Philadelphia, Showing the Arrangement of Automobiles Under New Traffic Regulations

Director of Public Safety, George D. Porter, has been experimenting with the idea of developing traffic regulations so that heavily loaded, slow-moving horse vehicles will not congest traffic. Broad Street has a width of seventy-five feet from curb to curb, all automobiles are now parked in the center, leaving a clear space on each side for all vehicles, which could not be said of conditions when the automobiles and wagons were drawn up to the curb. In turning corners the latest London traffic regulations are now being enforced in Philadelphia, cars not being allowed to cut across the corners, but have to cross the street onto which they intend to turn and make a long curve around the safety aisle on the further side of the street. This prevents accidents and congestion. Incidentally this photograph forms a very nice puzzle. Find the horse!

AMONG THE MANUFACTURERS

JOHN M. WILLYS PURCHASES A CONTROLLING INTEREST IN THE GRAMM MOTOR TRUCK COMPANY

B. A. Gramm, Vice President and General Manager of the Gramm Motor Truck Company, Remains in Charge of the Gramm Plant, But the Sales Management Will be Taken Over by One of the Willys Companies.

John M. Willys, president and owner of the Willys-Overland Company, and the Willys-Garford Company, one of the largest makers of pleasure cars in this country, has bought a controlling interest in the Gramm Motor Truck Company, Lima, O., makers of the well known Gramm trucks. The Gramm Motor Truck Company is capitalized at $1,250,000, being $500,000 preferred stock and $750,000 of common stock. It is understood that Mr. Willys bought about $450,000 worth of the common stock from Arthur L. White and W. T. Agerter, formerly president and treasurer of the Gramm Company. B. A. Gramm,

B. A. Gramm

John M. Willys

the organizer of the Gramm Motor Truck Company, and its vice president and general manager, it is understood retains his interest in the company, and will be manager of production at the plant. It is understood that Mr. Willys will become president of the company, and that it will be known as the Willy-Gramm Truck Company, the sales department being turned over to either the Willys-Overland or the Willys-Garford Company. This is an ideal combination. Mr. Willys, one of the greatest pleasure car manufacturers in the world, has demonstrated his ability as an organizer and general manager, and Mr. Gramm, one of the most experienced truck manufacturers, has demonstrated his ability as an engineer and constructor, therefore this combination will be one of the most powerful in the business. It is stated that the Lima plant will be greatly enlarged, and that the output will be doubled within the year to take care of the market which the 2000 agents of the Willys organization will open up for Gramm trucks.

INTERNATIONAL MOTOR COMPANY EXPANDING

The International Motor Company, New York City, recently elected Edmund C. Converse and Ambrose Monell additional directors of the company. Both men are high in the financial world. Mr. Converse is president of the Bankers' Trust Company and an officer in a number of important manufacturing companies. Mr. Monell is president of the International Nickel Company, and a director in a number of trust companies and banks. Mr. Converse succeeds W. D. Sargeant as chairman of the Board of Directors. It is the intention of the International Motor Company to turn out over 2000 motor trucks during the season of 1912. Of this number, the Mack plant at Allentown, which has turned out 125 a month, will in the next month turn out 150 per month, and later as many as 200 per month. The Saurer plant has a capacity of 400 and the Hewitt, 350. A 1500 lb. car has been added to the Mack line of which 2000 will be built for 1913.

The International Motor Company's Mack plant at Allentown, Pa., has been enlarged by the addition of the plant that was formerly occupied by the Unity Silk Company. This building is now being altered and equipped with machinery.

A NEW BAY CITY, MICH., ONE THOUSAND POUND DELIVERY CAR

The Winonah Motor Car Company has been organized in Bay City, Mich., to build a commercial car weighing 1000 lbs., which it is said will sell for $900. E. G. Porter, formerly connected with the Detroit Company, is general manager. The company has leased a building at the corner of 11th & Saginaw Streets.

THE DRIGGS-SEABURY COMPANY MAY TAKE OVER THE MANUFACTURE AND SALE OF THE COMMER TRUCKS

Announcement has been made that the Driggs-Seabury Ordnance Corporation, of Sharon, Pa., who have been building the Commer truck for the Wyckoff, Church & Partridge Company, will continue to build the Commer truck and supply it direct to agents, should the Wyckoff, Church & Partridge Company not be re-organized. In the meantime the Driggs-Seabury Company is supplying the cars to the receiver, and is also building a truck of their own design to be known as the Sharon.

NOTES

KUHNER ENGINE COMPANY, Oxford, Md., will place a line of delivery cars on the market.

WILLYS-OVERLAND COMPANY, Toledo, O., has put two new delivery wagons on the market.

LAUTH-JUERGENS MOTOR CAR COMPANY, Freemont, O., will erect a one-story addition to its plant, 60 x 200 ft.

THE SELDEN MOTOR CAR COMPANY, Rochester, N. Y., is bringing out a new model of commercial car.

DIAMOND RUBBER COMPANY, Akron, O., is building an addition to its No. 15 building, 275 ft. long and six stories high.

A NEW TRUCK COMPANY will be organized in Davenport, Ia. Gus. F. Burmeister and John W. Buck are interested in same.

BARTHOLOMEW COMPANY, of Peoria, Ill., maker of the Glide commercial cars, has increased its capital stock from $200,000 to $350,000.

IDEAL COMMERCIAL CAR COMPANY, Detroit, Mich., is making arrangements to move its plant to Akron, O., through the Chamber of Commerce.

THE LAMBERT-MORIN MOTOR VEHICLE COMPANY, Lawrence, Mass., a new concern in the commercial car field, will build an electric commercial car.

CARTER CAR COMPANY, Pontiac, Mich., has moved into new quarters at 1840 Michigan Avenue, Chicago, Ill., where it will have salesrooms and service station.

LEITNER MOTOR TRUCK COMPANY, Kenton, O., has established a plant in the Carter Building on W. Franklin Street, and will start operation with about 25 men.

HESS SPRING & AXLE COMPANY, Cincinnati, O., has completed a new building 75 x 250 ft. which will increase its capacity to 15,000 sets of automobile axles a year.

INTERNATIONAL MOTOR COMPANY, maker of Mack and Saurer trucks, has established a branch salesroom and service station, 1620 Walnut Avenue. Cleveland, O., in charge of Chas. J. Ross.

INTERNATIONAL MOTOR TRUCK COMPANY, New York City, has leased the first floor of the warehouse at the corner of Gay and Water Streets, Baltimore, Md., and will remodel same into salesrooms.

ROWE MOTOR TRUCK COMPANY, Coatesville, Pa., has opened an Eastern sales branch 3278 4th Avenue, New York City. George I. Pound, assistant sales manager of the company, will be in charge.

OHIO MOTOR CAR COMPANY, Cincinnati, O., has included a course of instruction for drivers in the company's service department, the course occupying two weeks,—one in the factory and one on the road.

THE OWENS WAGON & AUTOMOBILE WORKS, Charlotte, N. C., has been incorporated with $50,000 capital to acquire the Charlotte Wagon Works, and add a department for manufacturing commercial cars.

DAY AUTO COMPANY, Trumbull Ave., Detroit, Mich., manufacturer of the Day Utility Car, has leased a new factory building at 25 E. Milwaukee Avenue. The new building will give the company 20,000 sq. ft. of floor space. A service department for local owners of the Day cars will be established on the first floor of the new building.

LUVERNE AUTO COMPANY, Luverne, Minn., announces that it will place a one-ton truck on the market within a short time. It will be equipped with a 40 horse-power engine and a heavy duty clutch and transmission.

EAST DAVENPORT MACHINE SHOP, Davenport, Ia., has under construction two experimental commercial cars, and if these cars prove satisfactory the concern expects to enlarge their facilities and build trucks regularly.

JOHNSON SERVICE COMPANY, Milwaukee, Wis., who heretofore manufactured both pleasure and commercial cars, announces that it has discontinued the manufacture of pleasure cars and hereafter will make commercial cars exclusively.

CINCINNATI MOTOR COMPANY, Cincinnati, O., has been formed by Frank Older, J. B. Doan and H. T. Alder, who have purchased the plant of the defunct Power Car Company. The new company will build both pleasure and commercial cars.

ENGLISH DAIMLER COMPANY, who has been using a Knight Sleeve Valve Engine in its cars for several years, has announced that it will use this engine for equipping commercial cars of one, two, three, four and five-tons capacity. This engine will be of the four cylinder type, made in four sizes.

VAN-L TRUCK COMPANY, Grand Rapids, Mich., has been succeeded by the Commercial Service Company, capitalized at $175,000. The officers are: president, Philip Morran, vice-president, J. W. Landman; secretary and treasurer, G. H. Greenbauer; directors, Henry Brink, J. H. Hagen and S. Wesselius.

THE FORD MOTOR COMPANY, Detroit, Mich., has made arrangements to establish assembling plants at Los Angeles, San Francisco, Seattle, Portland, Kansas City and several other points including Manchester, Eng. These plants will be very large and will be used as service stations for the care of commercial vehicles as well as assembling plants.

THE MODEL GAS ENGINE WORKS, Peru Ind., the well known makers of gasoline engines, etc., are erecting a new plant at Pittsburgh, Pa., which will have a capacity of about 25 engines a day. This new plant will be devoted particularly ly to the manufacture of special engines for commercial cars and railway gasoline locomotives. The new plant will be in operation by July or August. Considerable additional Pittsburgh capital will go into the business.

THE B. F. GOODRICH COMPANY, Akron, O., has been reorganized as a New York Corporation, increasing its capital from $20,000,000 to $45,000,000, of which $30,000,000 is common stock and $15,000,000 7% preferred. The controlling interests in the new company remain the same as in the old. The holders of the old stock received $120 per share for the preferred shares, either payable in cash or in new preferred stock, and the holders of the common stock received 2.7 shares of the new stock for each share of the old stock and $78 per share in cash additional.

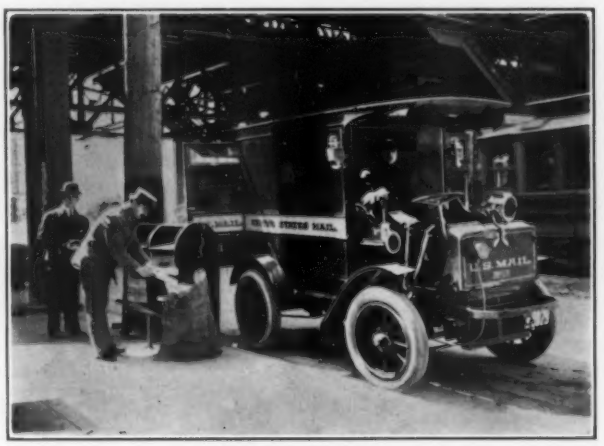
IN REPORTING on the exhibit of the Ward Motor Vehicle Company, Concord Avenue & E. 43rd Street, New York City, they were mentioned as a new concern, the writer of the item having overlooked the fact that they were successors to the Pittsburg Motor Vehicle Company, and have been makers of electric commercial cars for several years.

Mail Collection by Motor Car

Guaranteed Service by Autocars for U. S. Mail Collection in Philadelphia

In the Fall of 1909 a novel arrangement was made by the Postmaster of Philadelphia with the Autocar Company, makers of the well-known Autocar commercial cars, whereby four of these machines were placed in the mail collection service in the city of Philadelphia.

The conditions were unusual in that a continuous service of these vehicles for eight hours per day was guaranteed to the post office authorities by the Autocar Company for a set rental per year, with the proviso that the Autocar Company should be fined whenever, for any reason, the cars were unable to maintain their prescribed schedule. From that time until the present not only these four cars, but for the last few months five cars have been in constant daily use, maintaining with railroad-like precision the exacting schedule of the post office and not once has the Autocar Company been subject to a fine.



Collecting the mail by motor truck in Philadelphia, Pa. Five of these cars are employed and have a record of not having been fined once for delays in a period of two and a half years.

This does not mean, of course, that the cars have run this long period of time without any delays or mishaps, but it does mean whatever has happened has been of such a minor nature that repairs, replacements, or, in an extreme case, the use of an emergency vehicle has made it possible to collect the mails on this rigid schedule without ever having had a delay. This is perhaps one of the most remarkable demonstrations of the present reliability of the commercial car which has been made in this country. These cars average in the neighborhood of sixty-five miles per day of eight hours, making one trip in the morning and one in the afternoon and covering West, North and South Philadelphia, and also a central section, each car gathering the mails each trip from 68 to 85 boxes, some machines, however, running as high as 120 boxes.

Collections are made, one might also say, on the minute from the various boxes and the mail delivered on scheduled time to the various post offices in the respective section. The driver is not in the employ of Uncle Sam, but is paid by the Autocar Company, while the collector is a regular U. S. mailman in the employ of the government. He has nothing whatever to do with the operation or care of the truck.

Twenty Wagons and Forty Men Displaced

Not only is this service most satisfactory in point of speed, but it is also showing a saving in cost of operation over the horses previously used. The five trucks now in use displaced twenty single horse mail collecting wagons and forty men. In other words, five machines and ten men now do the work of twenty horses and wagons and forty men.

The four cars originally placed in service were at first equipped with solid tires, but the comparatively high speed and continuous negotiation of cobble stones and other bad pavements, and running into ditches to get next to the collection boxes, proved so severe that pneumatics had to be placed on the cars. The tires selected for this service on these 1500 lb. capacity machines are the Lee Punctureproof, 34 x 5 in. being the size used both front and rear. These have given excellent service, it is said, the punctureproof feature being especially valuable when a fixed schedule is to be maintained

The cars are garaged, repaired and all replacements made by the Autocar Company Service Department. In fact all expenses including gasoline, oil and the driver are shouldered by the company for the fixed rental, so that the post office knows for a year in advance exactly what the service is going to cost. If for any reason whatever a car is temporarily put out of business, it is immediately replaced or a new unit installed without an instant's delay, so that at no time in a period of over two years and a half have the cars been unable to maintain their exacting schedule.

The same kind of service is being given by this company to business firms with the ultimate idea of selling cars to these firms. Experience has shown that after a continued service of this nature over a period of from six to twenty-four months the users buy machines and install them in their own garages, this installation costing them much less on account of the experience gained under the eye of the well-trained service department.

The following is the record for one week of truck No. 6, and is very typical of the work of all the machines:

ONE WEEK'S RECORD, MAIL TRUCK NO. 6.

Date	Gas	Oil	Miles	Boxes A. M.	Boxes P. M.	First Trip Leave	First Trip Return	Second Trip Leave	Second Trip Return
Mar. 18	4 gal.		71¼	68	68	7.30	12 Noon	4.30	8.50
Mar. 19	12 gal.	3 qts.	74⅝	68	68	9.20	2.05 P. M.	4.30	8.55
Mar. 20	8 gal.	2 qts.	72¼	68	68	9.30	2.05 P. M.	4.25	8.55
Mar. 21	8½ gal.	1 qt.	72¼	68	68	9.25	2.10 P. M.	4.20	8.45
Mar. 22	8 gal.	1 qt.	71⅝	68	68	9.30	2.15 P. M.	4.15	8.55
Mar. 23	8 gal.	1 qt.	72⅝	68	68	9.15	2.15 P. M.	4.30	8.55
Average	8 1-12 gal.	1 1-3 qt.	72.4	68	68	4 hrs. 43 min.		4 hrs. 22 min.	

MAYOR FITZGERALD, of Boston, Mass., has sent letters to the School Committee and the Trustees of Franklin Union, Wentworth Institute and the Boston Y. M. C. A., asking them to establish a course in their schools for the instruction and handling of commercial cars. The mayor also stated that this instruction should be given encouragement and, as its great need was efficient drivers, the schools should be prepared to meet this need.

THE COMMERCIAL CAR JOURNAL

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The 1912 Table of Specifications of Commercial Cars will be included in the regular subscription price of $2.00 per year for the Commercial Car Journal until the supply on hand is exhausted.

SPECIAL ACCESSORIES NEEDED FOR COMMERCIAL CARS

A TRUCK, just as any other piece of mechanism, is no stronger than its weakest part, like the one-horse shay, in which all parts being equally well built finally gave way in all parts at the same time. The truck, if properly constructed, would last almost indefinitely up to the time of its disintegration. This is the aim of the commercial car manufacturer and the goal toward which he has been working.

The mechanism is now complete in all of its details and so well constructed by many of the truck makers that it all but approaches the one-horse shay in perfection. Unfortunately, however, there are a large number of parts which go to make up or adorn the truck as a whole which are not made by the car manufacturer. We refer particularly to the very numerous and necessary accessories. We said these go to make up or adorn the truck itself,—adorn seems to be the idea of a large number of accessory makers, and that is about all the use some of their devices are, when placed on a truck. These various accessories are made of polished brass, very lightly constructed and indeed, in fact designed solely for use on pneumatic tired pleasure cars upon which they doubtless will give satisfactory service. From their construction they were evidently never intended to be used on solid tired vehicles, and if there is any doubt about this, their behavior when used in such service, at once settles the matter, for they almost invariably shake to pieces, drop on the road and are run over, and very quickly find their way to the city dump.

Is it not time for the accessory maker, and now we speak of these manufacturers as a class, for there are notable individual exceptions, "To get onto the job," and manufacture something really suitable for use on the highly specialized solid tired motor driven commercial car?

Lamps, horns, speedometers, gages, clocks, and in fact every accessory should be made of heavier gage material, riveted, welded or brazed, rather than soldered and so made that it will stand the terrible punishment that every device is subjected to when used on a heavily loaded machine on solid tires, negotiating cobble stone pavement and car tracks. It is possible to build all of these devices, so that they will last at least for a time commensurate with the purchase price.

These devices should be finished in gun barrel blues, blacks or enamels to correspond with the adjacent portions of the machine; polished brass has no real place on such accessories on a commercial car. The drivers have enough to do, and the same is true of the mechanics and others who look after the cars at night without adding to their burdens the trouble of polishing a lot of unnecessary brass work.

There are a few makers now supplying accessories of special design, suited particularly to truck service, and these makers are to be commended upon their foresight and progressiveness. We trust in the near future the other makers will realize that most devices made essentially for touring cars will not give satisfactory service on heavy trucks.

FAILURE TO USE RECORDING DEVICES DUE TO IGNORANCE

WE are continually hearing complaints from the tire makers that the users are abusing their guarantees, and from the users that the tires do not give the service expected of them, from the truck salesmen that the user does not know the cost of operating his own machines, and from the user, that the drivers are careless, inefficient and unnecessarily abuse the trucks. Yet none of the parties concerned apparently have sufficient insight to see that the matter of $30 or $40 in additional equipment on each car would nearly always effectually prevent the troubles above mentioned.

If the average driver is not to be trusted, he is bound to speed the truck, so as to damage the tires, break the springs and jar the entire mechanism, then some form of a recording device in a steel case under lock and key, is an absolute necessity. This statement seems rather harsh, but these are about the conditions. How to account for the lack of business acumen of the average truck purchaser is a conundrum, solvable only on the basis of ignorance on his part.

It would seem apparent that even a tyro would appreciate that it is folly of the worse kind to pay $3000 or $4000 for a car and hand it over to a $12 a week dub to smash at his own sweet pleasure. Yet this is exactly what is being done every day and the pin-headed purchaser blames the result onto the manufacturer. In no other department of his business would a man be guilty of such gross negligence; with his stationary engine, which is not subjected to one-tenth the unavoidable hardship put upon his truck. He takes every precaution, special governors, fancy oilers, a high-priced engineer, insurance, everything is purchased to increase its life and safeguard his investment. It is the same in every other branch of his establishment; with the commercial car alone does he change his methods.

By some it is laid to indifference, by others to pecuniousness, but the real cause is abject ignorance, backed up and abetted by the fact that no such precautions were necessary before in delivering his goods. In his inability to rise quickly and adapt himself to the needs of the new equipment he now endeavors to apply the same old methods to the truck.

There are so many benefits to the truck service to be derived from the use of these simple and comparatively inexpensive devices that it would seem simply a matter of good judgment to have each and every truck equipped. Where they are used excessive speeds are of course possible, but the driver is not apt to indulge in them with such a device. Each driver's movements are virtually under the eye of the superintendent of delivery, and careless, irresponsible drivers can very soon be detected and their places filled by more competent men.

If, as is often stated, two-thirds of all the trouble with commercial cars is due to the drivers, it certainly follows that a small investment per truck is in order if this will do away with the existing trouble. Instruments, which record accurately every movement of a truck, the speed, the distance covered, the number of stops made, the time of each stop, etc., are readily obtainable and effectually put a damper on practically all the pernicious practices of the driver.

There is only one flagrant abuse not covered by these instruments and that is overloading. This still remains within the power of the operator. Where the service requires the use of several cars and a regular superintendent of delivery is in charge, he can to a certain extent prevent this latter trouble, but it is too often true that in smaller installations the owner himself is largely to blame and requests of the driver that more than is good for the truck, be placed upon it. This again is, of course, due to ignorance on the part of the owner. However, this can be remedied both by the delivery superintendent, the owner or the driver, if so inclined, by simply watching carefully that the load is uniformly distributed and keeping an eye on the spring deflection. It is a simple enough matter to one that is used to any given machine to tell by looking at the springs when it is being loaded beyond a safe amount. This is made more simple and brought within the jurisdiction of the owner, as the loading is usually done at home. In the case of speeding, careless driving and other troubles, these take place when out of sight of the home office, and therefore the need of recording devices.

It is difficult to believe, but the fact is being forced home to us, that commercial car users in general are not able to properly look after their own interests in this respect. There is but one conclusion, they must be placed under the care of a guardian, the commercial car manufacturer. In other words it devolves on the manufacturer to protect not only the equipment of the purchaser, but to safeguard his own interests by supplying, as an inseparable part of the truck itself, some form of recording device.

INDEPENDENTLY SPRING-SUSPENDED POWER PLANTS

CERTAIN recent truck designs which bring from 70 to 85 per cent. of the load directly on the rear wheels to the great detriment of the tires, have been so designed, it is said, that different tires could be used and less jar brought upon the engine. In other instances pneumatic tires are used on the front wheels also to relieve the jar and vibration due to heavy roads and rapid movement over uneven pavements. A rigid connection of the engine to the truck frame is now very rare, blocks, pads or even small stiff coiled springs being interposed, but these are largely for the purpose of intercepting any bending strains which might be put upon the crank case, due to weaving of the frame. There seems to be a need, however, for something more than this, for a construction which will permit perhaps of even higher speeds of the truck, yet without transmitting excessive vibrations to the motor.

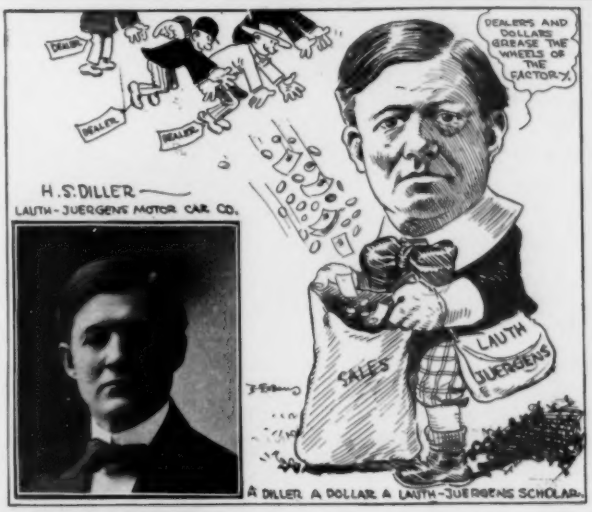
The method adopted by at least two makers is to mount the engine, transmission and radiator on a special sub-frame independently spring supported from the main frame. These springs, carrying as they do simply the weight of these more delicate parts and not being called upon to support any of the load, can be of light design suitable for the weight of these parts. Furthermore, they are not in any way affected by the load on the truck. By the old method springs entirely too stiff for the actual weight of the parts carried, when the truck is running empty, had to be used in order that sufficient carrying capacity might be had to care for several tons of pay load. It will at once be seen that this method of separate spring suspension is perfectly practical and the principle underlying it most plausible.

Although the comfort of the driver has not in many cases been given especial thought, yet as detailed refinements are incorporated this subject will receive further attention and incidently the separate spring suspension for the power plant also provides an easy riding front seat. In view of the advantages to be gained it will be interesting to note how many makers during the coming year adopt some such form of separate power plant spring suspension.

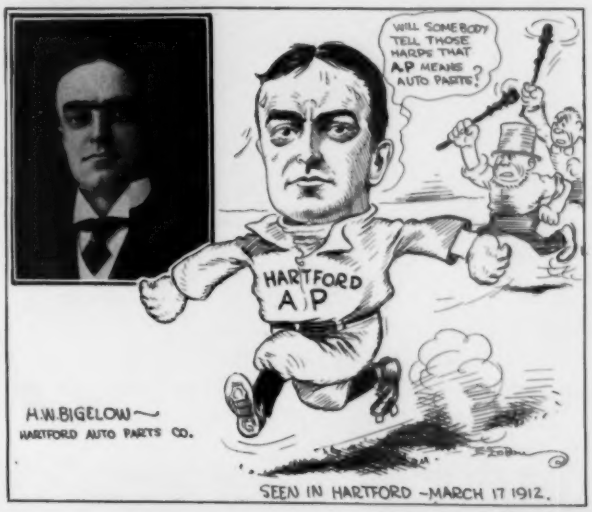
The Tacoma Ledger, of Tacoma, Wash., is authority for the statement that the fire loss in that city has been reduced from $496,000 in 1910 to only $151,000 in 1911, and that this reduction has been brought about mainly because of the addition to the Fire Department of a motor truck, motor hose and engine wagon combined, and a motor hose wagon, making a total of nine motor fire machines in the city. This motor equipment enables the firemen to reach the fire before it gains any great headway.

THE COMMERCIAL CAR JOURNAL is on sale at Brentano's in New York and Paris.

OUR GALLERY OF SALES MANAGERS.



GEE ISN'T HE THE JAY BOY.
OUR BABY CHILDE HAROLD
CONDENSED RUBBER
H. A. GITHENS
FEDERAL RUBBER MANUFACTURING CO.
IS IT ANY WONDER GITHENS KNOWS THE TIRE BUSINESS?


WILL SOMEBODY TELL THOSE HARPS THAT A-P MEANS AUTO PARTS?
HARTFORD A P
H. W. BIGELOW
HARTFORD AUTO PARTS CO.
SEEN IN HARTFORD - MARCH 17 1912.

CAST NOT YOUR PEARLS - LET US DO IT FOR YOU.
LEBANON STEEL FOUNDRY CO.
W. H. WORRILOW
PRESIDENT - LEBANON STEEL FOUNDRY CO.
PRESIDENT
SALES MANAGER
WHAT NEXT?

RAYMOND S. STEPHENS
DART MANUFACTURING CO.
"CUPID STEPHENS" 20TH. CENTURY DART FINDS MANY MARKS: (BUT ARE THEY MINES?)
CUSTOMER
DART

Poss Motor Truck Agency, 1109 Pine Street, St. Louis, Mo., has been opened by B. J. Werber.

Adams-Price Auto Company, Atlanta, Ga., has been formed to handle the Grabowsky commercial cars.

Mack & Saurer Agency, Holland Building, St. Louis, Mo., have opened a service station at 3426 Lindell Avenue.

Windsor Manufacturing Company, Windsor, Ont., has secured the agency for the Lincoln light delivery wagon for Canada.

A. F. Chase & Company, Minneapolis, Minn., have the Minnesota and Dakota agency for the Lincoln light delivery wagon.

The Universal Motor Truck Company, Detroit, Mich., has opened a Chicago branch at 2216 Michigan Avenue, with Charles J. Fisher in charge.

Garland Auto Company, representative for the Velie & Speedwell cars, 1657 Broadway, New York City, will move to new quarters at 1888 Broadway.

The Automobile Repair & Sales Company, Inc., 911-913 N. Broad Street, Philadelphia, Pa., has taken the eastern agency for the Sandusky commercial car.

Avery Truck Company, Columbus, O., has opened salesrooms at 820 W. Broad Street for the display of Avery trucks. The company will cover Central Ohio.

H. F. Young, Cleveland, O., formerly connected with the Chase Motor Company, has joined the sales forces of E. P. De Gollier, who handles the Little Giant truck.

The Kelly Motor Truck Company has recently established a factory branch in Baltimore, Md., at 11 East Twenty-first Street, under the management of F. B. Ernest.

S. Reese Machine & Tool Works, Plymouth, Pa., has secured an agency for the Lincoln light delivery wagon and will open a new salesroom at Wilkes-Barre, Pa.

E. K. Callahan, formerly of the Packard Motor Car Company, truck department, is now with the Speedwell Sales Company, handling Speedwell and Lippard-Stewart cars.

St. Louis Alco Company, St. Louis, Mo., agent for Alco trucks and pleasure cars has been succeeded by the Missouri Motor Car Company. R. R. Ford is to be manager of the truck department.

The Motor Wagon Company of New Jersey, 223 Halsey St., Newark, N. J., has been organized to take the sales agency for the Detroit Electric Delivery Wagon and the White Star Gasoline Truck.

International Motor Company's Buffalo branch will be moved on May 1st from 1206 Main Street to 1259 and 1261 Main Street. At the new address the service station will be established in addition to the sales room.

Blair Manufacturing Company, Newark, O., has appointed James Eagan, 2253 College Grove Avenue, Chicago, Ill., and Adamson Automobile Company, 35 W. Mound Street, Columbus, O., agents for their Blair trucks.

C. A. Scott Company, Portland, Me., organized with $10,000 capital to deal in automobiles, trucks, engines, motors, etc., of all kinds. Officers are, president, Hugh Lawless, Portland; treasurer, Chas. A. Scott, Portland.

Nuss Wagon & Automobile Company, Frelinghuysen Avenue and Poinier Street, Newark, N. J., have taken the agency for the McIntyre and Sternberg commercial cars as an addition to their body building and repair work.

Steckel Motor Truck Company, 1414 Ridge Avenue, near Broad Street, Philadelphia, Pa., has secured the agency for the B. O. E. motor trucks and Lincoln light delivery wagons for Eastern Pennsylvania and Southern New Jersey.

Kleiber & Company, San Francisco, Cal., distributors of Gramm trucks, have established an office, also salesrooms, in the Weinstock-Nichols Building, Golden Gate Avenue. They will continue their machine shop and garage on Folsom Street.

Norwood Brothers, 408 Continentaal Building, Baltimore, Md., will act as distributing agents for the Lincoln Motor Car Works, Chicago, Ill., to handle the Lincoln Light Delivery Wagons in the state of Maryland and District of Columbia.

F. E. Gilbert Company, Jacksonville, Fla., have sold their building, corner Laura and Church Streets, at a handsome profit and are now building a new, large salesroom, garage and service station, described as the largest automobile concern in the South.

The R. & L. Company, eastern distributors for Garford cars and trucks, have established a Newark, N. J., branch at 987 Broad Street. They are also erecting a four-story building at Central Avenue and Halsey Street, which they will occupy as soon as finished.

Remy Electric Company, Anderson, Ind., has arranged with Child, Day & Churchill, Inc., Spokane, Wash; Washington Auto Supply Company, Seattle, Wash.; and Archer & Williams Company, Portland, Ore., for Remy service stations in their respective cities, handling a full line of Remy ignition products, and retaining a corps of skilled experts.

Swinehart Tire & Rubber Company, Akron, O., has added five new salesmen to their force. B. M. Griffiths and J. B. Taggart have been assigned to the Philadelphia branch, and R. A. Kerr and G. W. Hansen and J. W. Benton have been added to the Chicago force. In addition to these Raymond Frieze succeeded F. W. Dougherty at Boston, R. F. Frewin succeeded C. W. Harris at Chicago, and John R. Allen has been added to the force at Akron.

The Hyatt Roller Bearing Company's Plant at Newark, N. J.

The above photo shows the immense plant in which the well-known Hyatt Roller Bearings are manufactured. The plant consists of a group of brick, mill-construction buildings of modern design, all of which have been erected within the past six years. The various buildings are separated sufficiently from one another to reduce the fire hazard to a minimum, and in addition the entire property is thoroughly protected from fire by a fifty thousand gallon water tower connected with automatic sprinklers. The company maintains its own fire department. The entire plant is electrically driven, every floor being absolutely independent. The company operates its own power house of 1000 h.p. capacity, divided into several direct-driven units preventing all possibility of any serious interference with production in case of accident. An indication of the capacity and output of the Hyatt Plant may be gotten from the fact that in the Roller-cutting department sixty-five metal-cutting band saws are required, and that over one hundred and fifty thousand rollers have been handled through the various roller-cutting departments in a single working day of ten hours.

LARGE MILEAGE GUARANTEES BEING PROVEN

With the use of high tensile strength steels and metals of superior quality many manufacturers are giving large mileage guarantees upon their products.

The Jarvis Huntington Automobile Company guarantees its trucks against defective material and workmanship for 10,000 miles, and will replace free of charge, new parts in exchange for defective parts, provided said defective parts are returned to them charges prepaid. This guarantee does not apply to tires, electrical equipment, wear and tear, accidents, or misuses of truck.

IN REMEMBRANCE OF S. A. E. EUROPEAN TRIP

Members of the Society of Automobile Engineers who participated in the recent European visit have purchased, by subscription, a Waltham chronometer for presentation to Arthur Ludlow Clayden, a member of the society resident in London. The idea of an official visit to England was first suggested by Mr. Clayden while making a tour of this country last summer, and upon his return to England he actively engaged in the preparations made to receive the American visitors. During their visit Mr. Clayden devoted much of his time to the entertainment and comfort of the party, and in recognition of this the gift bears a plate suitably engraved.

The chronometer selected is an exceedingly accurate time piece having a rate of only sixteen seconds a month variation. It makes a handsome and useful desk ornament.

THE COMMERCIAL MOTOR CAR COMPANY DISCONTINUES BUSINESS

Arthur J. Slade, well known commercial car designer, transportation expert, and head of the Commercial Motor Car Company, Times Building, New York, N. Y., announces that this company will be discontinued owing to several of the men associated with him having taken positions with manufacturers, and his own time being now taken up extensively with consulting work and designing. The financial condition of the company is entirely satisfactory, there being no outstanding obligations.

Mr. Slade will also continue his consulting engineering work with headquarters at 1600 Broadway, New York, N. Y.

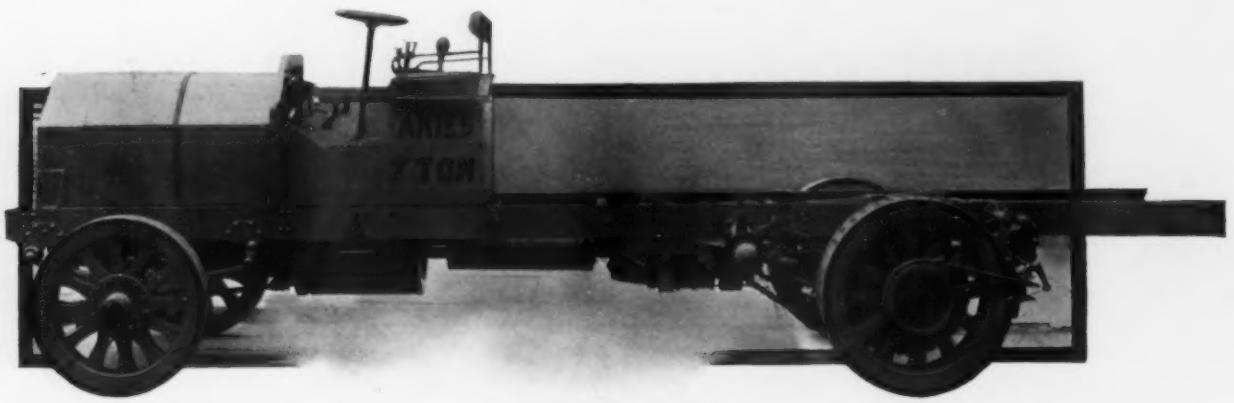
Indianapolis Outdoor Automobile Show

The Indianapolis Automobile Trade Association Show, which was held from March 20 to 30, was quite a novelty, in the fact that it was held out of doors under canvas. The immense tent in which it was held surrounded three sides of one of the city parks covering the distance of a third of a mile. There was an elaborate electrical display which enhanced the floral and bunting decorations. About two hundred automobiles of every description, besides many makes of motorcycles and accessories, were shown. Three orchestras, one in each wing of the tent, furnished music.

Commercial vehicles were exhibited by: Buick Motor Company, Buick truck; Carr's Auto Place, Little Giant; Finch-Freeman Auto Company, Service; Avery Company, Avery; International Harvester Company, I. H. C. truck; Auburn Motor Company, Auburn; Morton Place Auto Company, Dreadnaught-Moline; Merchants Electric Auto Company; General Motors Company, Kelly; McFarlan Six Sales Company, Whitesides; Mais Motor Truck Company, Mais; Premier Motor Sales Company, Premier; Walker Electric Company, Walker.

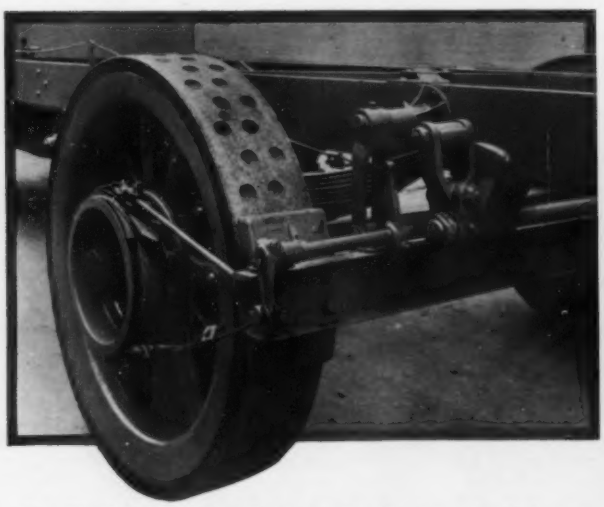
Aries Commercial Cars

J. Jaccard & Company, of 213 West Sixty-ninth Street, New York City, are offering to buyers of commercial cars the Aries truck for 1912 which is shod with steel tires. This truck is manufactured by the Aries Automobile Company in Paris, France. This truck is intended primarily for heavy load carrying and is classed as a seven-ton capacity vehicle. There are two styles of chasses to be had, the only difference between them being that one has the motor under the hood in front of the driver and the other has the motor under the driver's seat. The main point to be brought out about these Aries trucks is the steel tire equipment, which is stated to be very inexpensive and entirely beyond the experimental stage, having been used in France and other continental countries for some time by the military authorities. The fact that the most expensive item on the upkeep bill of the commercial car has been almost eliminated should prove a great factor in the success of Aries trucks.

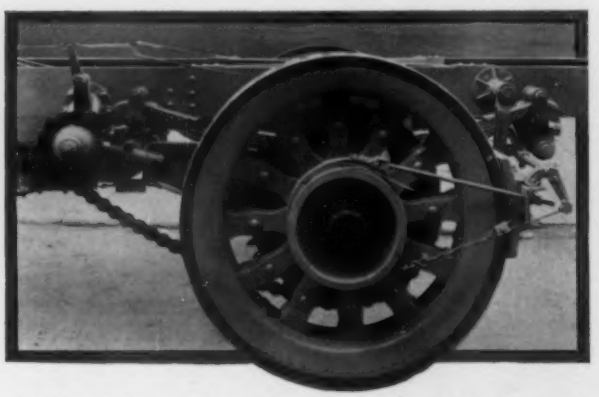


Aries Seven-Ton Truck

This commercial car lists at $6000 and is powered by a 40 h.p., four-cylinder, four-cycle motor, which is water-cooled. Note the extra heavy spokes in both front and rear wheels, same being necessitated by the use of steel tires, which naturally do not yield very much to road inequalities.



Rear Wheel of the Aries Truck; showing the railroad type shoe brake operating directly on the steel tire, and drum brake on the outside of a wheel. The steel tires are one of the main features of the Aries truck. The springs are connected to the frame by means of double swivel shackles, which take up both longitudinal and crosswise motion in traversing rough territory.



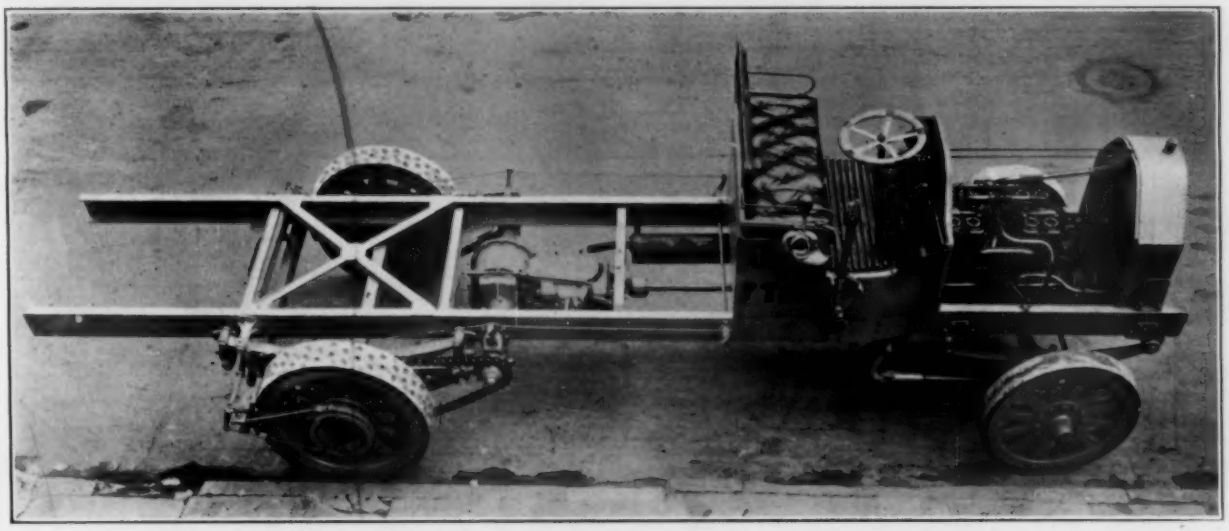
Side View of One of the Rear Wheels On the Aries Truck; showing the adjustable radius rod, exterior drum brake, and means of adjusting both it and the shoe brake.

Motor

The motor is of slow speed, four-cycle type, having four cylinders which are cast in pairs and water-cooled. The water jackets are ample in size and surround the valve cages, thus effectively cooling that portion of the cylinder which is subject to the greatest heat. The cylinder bore is 5 in. and stroke 5¾ in., the stroke overlapping the bore by ¾ in. The valves are located on both sides of the cylinder heads, being operated from two cam shafts through the usual arrangement of valve lifters. The horsepower developed is forty. The cooling of the engine is further assisted by pump and six-bladed sheet metal fan which sucks the air through the radiator. The carburetor and water pump are on the inlet side and the magneto on the exhausting side. The upper part of the crank case projects sideways to the sub-frame on each side for the entire length of the motor, thus forming a very substantial means of motor suspension. A forced feed oiler having a sight feed on the dash supplies the lubricant to the proper places through piping of ample size. The radiator is of the fin tube type and rests on a rubber cushion which in turn rests on the supporting saddle. The carburetor used is a G. & A., and the ignition is from a Bosch magneto. The motor bearings are plain.

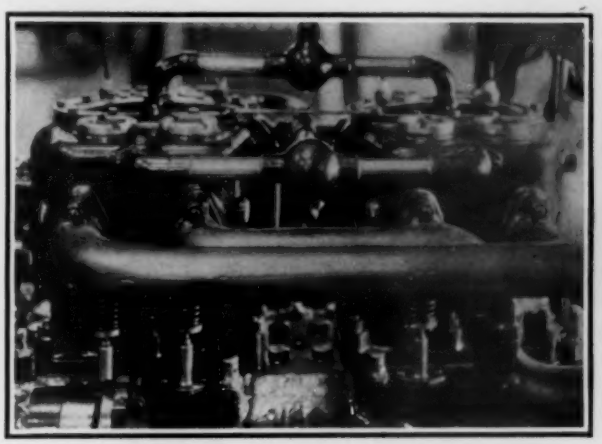
Transmission and Clutch

The clutch is of the dry disc type, having thirty-nine discs alternate bronze and steel. Adjustment can be made by the slight movement of a nut on a fine pitch screw. The transmission is of the selective sliding type, allowing three speeds forward and reverse. The whole transmission and differential are enclosed in a cast steel case, and all gears are constructed of nickel steel. The gear box casing is of the conventional box shape, the differential case being of cylindrical outline, the ends being extended to form sleeves or bearings for the jackshaft. The end of the right side is fitted with projections, forming an anchorage for the heavy working brake, the drum of which is in a recess at the side of the cylindrical differential casing. The transmission gears are ball.

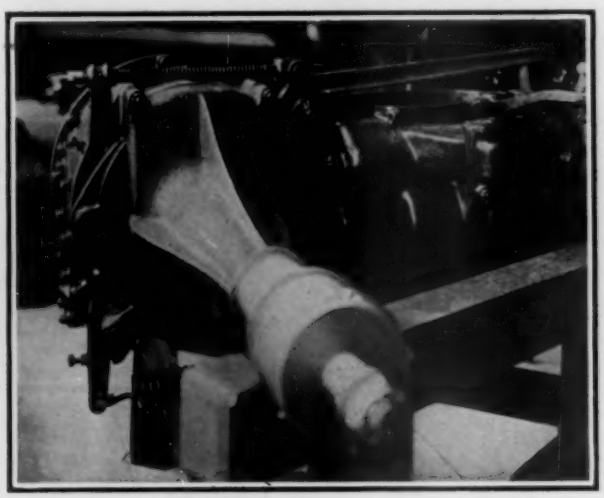


Aries Seven-Ton Truck

This view shows very clearly the disposition of the various driving members and method of strengthening the frame by means of diagonal braces



Side View of the Aries 40 h.p. Motor; showing the manifolds, valve springs, water connections and caps over the valves.



Jack Shaft of the Aries Truck; showing the webs used in the housing to secure strength combined with lightness

Frame

The frame is constructed of Longwy channel steel and is thoroughly braced by cross pieces both straight and diagonal.

Brakes and Wheels

Two sets of brakes are provided. The service or foot brake is of the shoe or railroad type and is adjustable by means of a thumb screw. The shoes can be easily removed and new ones substituted when necessary. As will be noted from the illustration these brakes act directly on the steel tires. The other set of brakes acts on a drum, secured to the outside of the rear wheels, and is very simple in construction.

The wheels are of wood with very heavy spokes, tires, as noted before, being of steel. These tires are forged from special alloy steel and are 1¾ in. thick. They are shrunk on to the felloe and are secured by bolts. The front wheels have 5½-in. faces and the rear wheels 8½-in. faces. Special sets of extra rims can be furnished with anti-skid rubber block tires for use in winter if so desired.

War Department Conducts Truck Test

THAT the war department seriously considers commercial cars for use in the army is evident from the rigorous test conducted March 28th, at Fort Benjamin Harrison, Indiana.

Start At Washington

The itinerary observed netted approximately 1500 miles, of which about 1400 miles was through mud. Leaving Washington, the route was to Atlanta, via Rome, Chattanooga, over the mountain road, which provided some hard going, to Nashville and Fort Benjamin Harrison.

There were four cars in the run, a 1½-ton White, a 1500-lb. Sampson, a Four-Wheel Drive one-ton car and a 1½-ton Autocar.

The Sampson was withdrawn in the early stage of the test because of bearing trouble.

Captain A. E. Williams, of the 19th infantry, and Captain H. A. Hegeman, of the quartermaster's department, had charge, the latter joining at Atlanta.

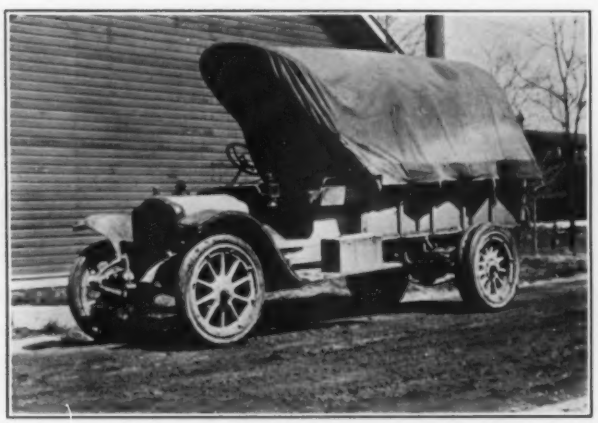
Roads Inundated

Out of Rome, Ga., the Four-Wheel Drive proved efficacious. The roads were inundated, the water being up to the hubs, submerging the carburetors. It was here the four wheeler did good work as a tow car.

Carried Rated Loads

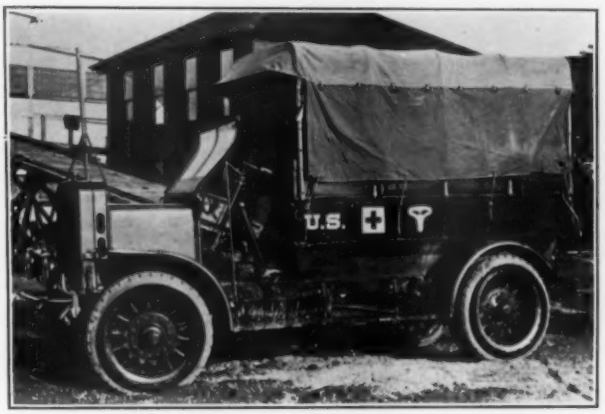
The cars were loaded to the rated capacity.

The average daily run was approximately 50 miles. As might be expected on a trip of this nature there was some tire trouble, but the officers in charge seemed well satisfied with the outcome.



Government Motor Ambulances

One of four ambulances recently completed by the Mais Motor Truck Company and shipped to Fort Leavenworth, Kansas, to be employed in the field operations at that extensive post. The bodies are mounted on a one and a half ton Mais chassis.



White Army Wagon

One and a half ton shaft-driven truck which participated in the fifteen hundred mile Washington to Indianapolis commercial car run conducted by the War Department. This test began at Washington, D. C., February 8th and terminated at Fort Benjamin Harrison, Indiana, on March 28th. Fourteen hundred miles of the trip was made in mud.

Commercial cars are again scheduled for extensive use in the summer field and marching activities of the army.

Captain H. A. Hegeman, quartermaster's department, Fort Benjamin Harrison, Ind., is desirous of hearing from manufacturers with a view to entry of cars in the summer maneuvers. It is estimated that about 2000 cars will be needed in the near future.

Autocar Which Made Perfect Run In the Recent Army Tests

LOCOMOBILE 1912

FOR a long time those interested in the development of commercial motor vehicles have known that the Locomobile Company of America were intending to put on the market a large capacity truck, whose design would incorporate the results of their long experience. This car has now made its appearance and is described herewith.

The Locomobile Company decided to fit their trucks with a double chain drive, as this method gives the greater strength, great flexibility and maximum tractive effort.

Motor

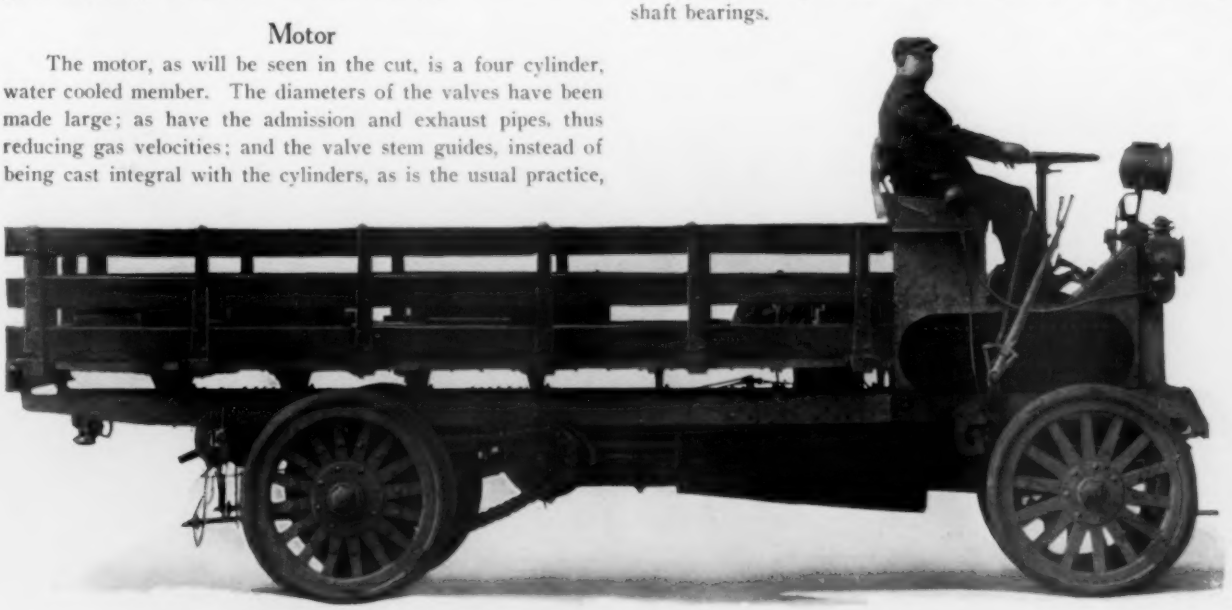
The motor, as will be seen in the cut, is a four cylinder, water cooled member. The diameters of the valves have been made large; as have the admission and exhaust pipes, thus reducing gas velocities; and the valve stem guides, instead of being cast integral with the cylinders, as is the usual practice, are cast separately and then forced into place so that they can be replaced if worn.

The exhaust manifold is made in two parts, one of which telescopes inside the other.

The cylinders, after being bored and reamed, are ground to a finish, as are also the pistons. The piston is fitted with four ¼ in. rings above the wrist pin, each of which has been annealed to relieve it of all internal strain and has been carefully ground and finished to an exact fit.

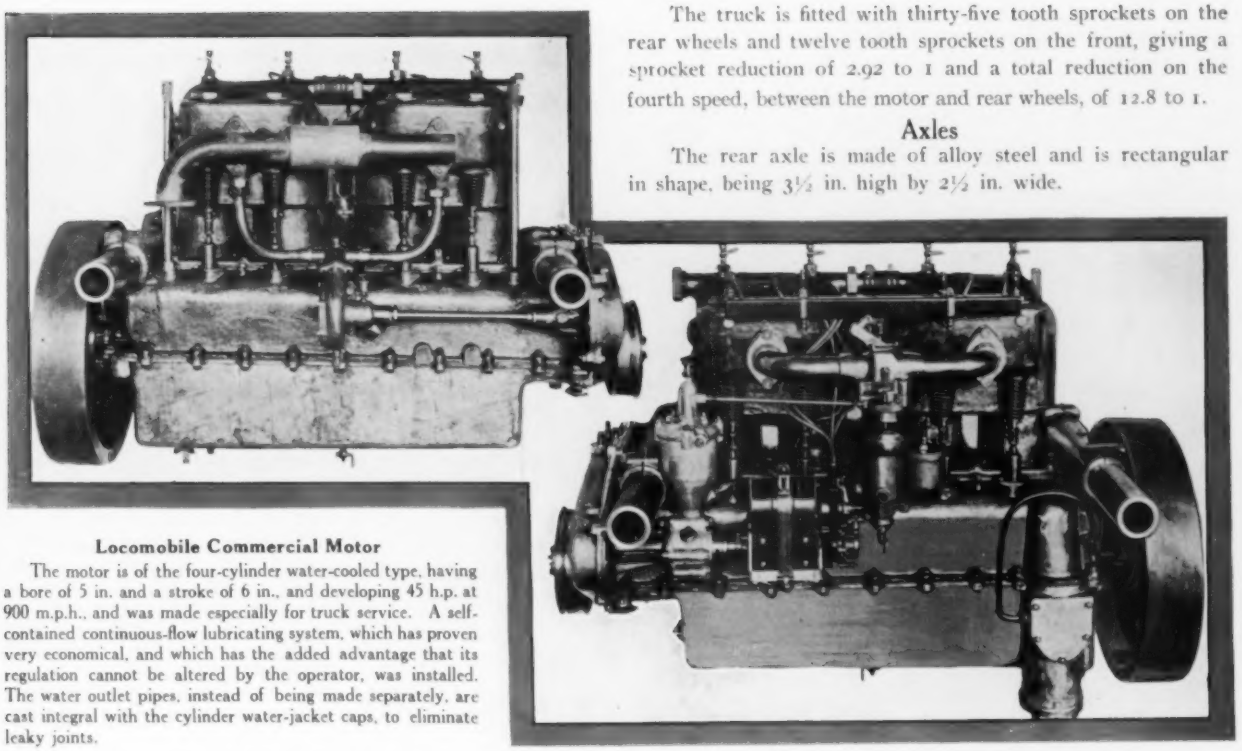
In the crank case the Locomobile Company have followed their standard practice by using bronze thus insuring alignment of the crank bearings.

Two 3 in. steel tubes pass through holes bored in suitable lugs in the front and rear of the crank case and are held firmly in position by means of clamp bolts, which draw together the slotted ends of the two bearings. Cast steel bearing brackets, bolted rigidly to the frame after the motor has been properly aligned, support the tubes and keep them in place by means of caps bolted down. This method of support makes it very easy to remove the motor from the frame, and eliminates any strain on the crank case or on the crank shaft bearings.



Locomobile Five-Ton Commercial Car

As will be seen in the cut, the design of the car shows a very compact arrangement, affording a very large platform space, and at the same time making the truck one which has a very small turning radius, only a 27½-ft. radius being needed to make a complete turn. The driver's seat is located over the motor, so as to afford the maximum platform space and the maximum carrying capacity for the wheel base, and also to enable the operator to handle his truck more easily by having an unobstructed view in all directions. In the production of this truck no parts have been used which were designed for use on any of the various types of pleasure cars that this company has constructed. Each part has been designed for the truck, so that it will be able to withstand the more severe duty to which trucks are subjected.



Locomobile Commercial Motor

The motor is of the four-cylinder water-cooled type, having a bore of 5 in. and a stroke of 6 in., and developing 45 h.p. at 900 m.p.h., and was made especially for truck service. A self-contained continuous-flow lubricating system, which has proven very economical, and which has the added advantage that its regulation cannot be altered by the operator, was installed. The water outlet pipes, instead of being made separately, are cast integral with the cylinder water-jacket caps, to eliminate leaky joints.

The governor is set for a speed of 900 r. p. m., and after being carefully adjusted, it is sealed to prevent its being changed. It is connected by linkage to a butterfly valve in the carburetor, which remains wide open at all speeds below 900 r. p. m., at which speed the governor cuts off.

The carburetor is of standard Locomobile design. It is of the float feed type, and is fitted with both a hot air regulator and a hot water jacket.

Transmission

The transmission case proper, which is a manganese bronze casting having a tensile strength of some 68,000 lbs. per square inch, comprises the top instead of the bottom half of the transmission case, as is the usual practice. The bronze top half is supported from the frame and the clutch pinion counter shaft and main shaft are attached to it by collars.

The transmission case is hinged in front to a channel-section cross member and is supported behind by jack-shaft housings, which are bolted to it so as to form an integral part. These housings are held by spherical bearings in cast-steel brackets bolted to the chassis side channel members.

The transmission, of the selective type, has four forward speeds and a reverse.

The truck is fitted with thirty-five tooth sprockets on the rear wheels and twelve tooth sprockets on the front, giving a sprocket reduction of 2.92 to 1 and a total reduction on the fourth speed, between the motor and rear wheels, of 12.8 to 1.

Axles

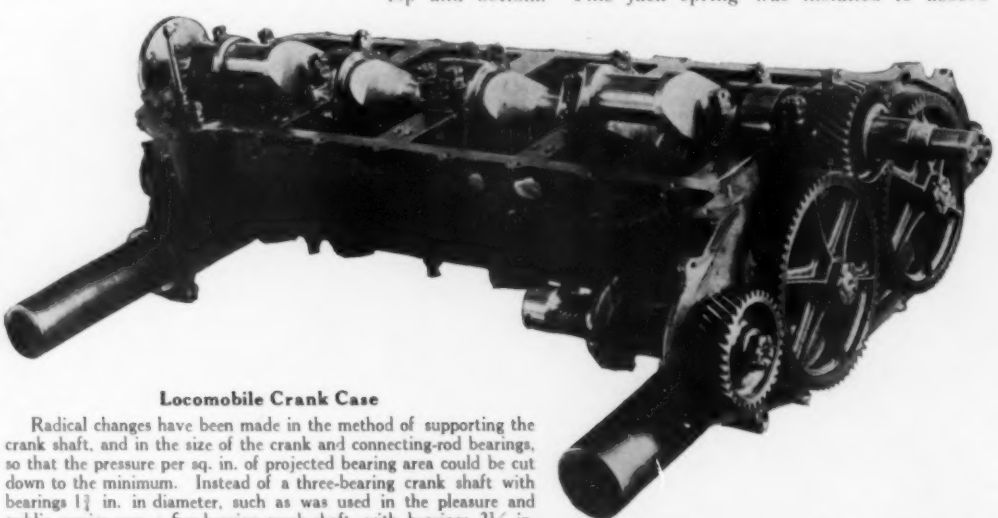
The rear axle is made of alloy steel and is rectangular in shape, being 3½ in. high by 2½ in. wide.

The wheels are carried on roller bearings capable of carrying 17,500 lbs. per axle, a figure which would not be reached even under the maximum overload conditions.

Springs

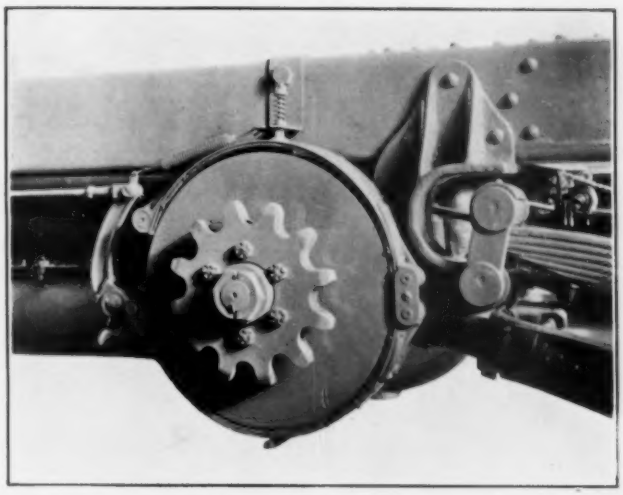
Spring chairs, carrying springs, fit around the rear axle; and from these chairs the emergency brake shoes are supported, in consequence of which the braking strains are absorbed by the rear springs. The rear springs, which are 50 in. long and 3 in. wide, have a normal capacity of 6000 lbs. each.

The truck is fitted with a 3 in. jack spring hung parallel to and above the rear axle from a spring chair supported by diagonal frame members heavily reinforced by gusset plates, top and bottom. This jack spring was installed to absorb



Locomobile Crank Case

Radical changes have been made in the method of supporting the crank shaft, and in the size of the crank and connecting-rod bearings, so that the pressure per sq. in. of projected bearing area could be cut down to the minimum. Instead of a three-bearing crank shaft with bearings 1¾ in. in diameter, such as was used in the pleasure and public service cars, a five-bearing crank shaft, with bearings 2¼ in. diameter, was installed in the truck. In consequence, the crank-shaft bearings in the truck have a projected area of 41.34 sq. in., as against the projected bearing area of 21.54 sq. in. on the pleasure and public service cars.



Locomobile Jack Shaft

Like the main and countershafts, the jack shafts are made from very tough alloy steel and have an exceedingly large cross section. The square ends of these shafts fit into the compensating bevel gears, while the outboard ends, carried on a taper, fit the foot-brake drums, to which the front sprockets are bolted.

severe road shocks which would tend to produce excessive deflections in the rear springs, and also to take care of any rear spring overloading. The front springs are 42 in. long and 3 in. wide, and have a capacity of 2000 lbs.

One very unusual but important feature in the spring arrangement is the device used in connection with the spring link bolts and shackles. In order to prevent wear the hardened steel link pins, which pass through the bronze spring bushings, are welded to one shackle by the oxy-hydrogen process, making them one solid unit and preventing any relative movement between them. The other shackle is bolted on.

All spring link pins are provided with grease ways and are drilled to distribute the grease from the grease cups, which are cut from the solid and are integral parts of these bolts.

Locomobile Dry-Plate Clutch

This clutch is entirely self-contained and is carried on the flywheel alone, preventing any possibility of the plates getting out of alignment. Its connection with the transmission is through a drive shaft, which has a universal action. The seven driving discs, which engage with six hardened and ground driving bolts attached to the clutch drum bolted to the flywheel, are made of ⅛-in. sheet steel, carefully hardened and ground on both sides. The seven driven discs, which are mounted on the clutch disc retainer, are made of ⅛-in. sheet steel and are lined on both sides with a non-burn material 5-32 in. thick.

Cast Steel Wheel

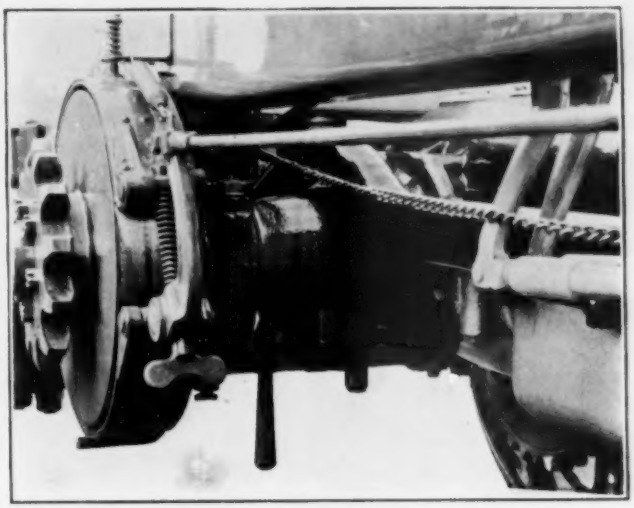
After long experience with wooden wheels the Locomobile Company decided to equip their truck with cast steel wheels, which are considerably lighter than wooden wheels. The cast steel rear wheels on the truck weigh over 50 lbs. less than similar wooden wheels. 40-inch wheels were adopted, it being found that they were more economical in tire consumption, afford a larger clearance, are more easily raised over an obstacle, such as a curbstone, and do not bank up the earth in front of them as the smaller wheels do on the country roads. The front wheels are fitted with a single 6-in. solid tire, while the rear wheels each carry two 6-in solid tires, these tires being interchangeable.

Springs

Heavy sprags, which can be dropped from the driver's seat by a chain on the steering post, are mounted on the rear axle.

Frame

The frame is made of pressed alloy steel of channel section. The side members are 6 in. high by 2½ in. wide by 5-16 in. thick, and are held together by six channel section cross members, which are heavily reinforced top and bottom by large steel gusset plates. As few holes as possible have been put in the frame, and all holes are drilled and reamed to size instead of being punched. All joints are hot riveted with ⅜ in. rivets.



Locomobile Differential Lock and Brakes

A compact, strong differential lock is carried on the right-hand jack-shaft housing for use in case an attempt should be made to start the truck with one wheel on soft, slippery ground while the other wheel has good traction. The contracting-type foot brakes are 13⅝ in. in diameter and 3 in. wide, giving the foot brakes an effective braking area of 225 in. Owing to the chain reduction, these brakes have as much braking effect on the rear wheels as the internal-expanding emergency brakes.

Other Details

Wheel base is 140 in.; tread, front 65 in.; tread, rear, 70 in.; height of loading platform, 46 in.; carrying space 14 ft. long and 6 ft. or more wide. The turning radius is 27 ft. 6 in. The superstructure carrying the driver's seat is so arranged that it can be easily removed without disturbing any of the control apparatus. The driver's seat tilts back, and the aluminum floor plates and the sides of the superstructure can be lifted if it is necessary to inspect the motor.

The gasoline tank, holding 25 gals., is located under the driver's seat, and is connected with the carburetor by means of a flexible metallic tubing.

The steering gear is of the screw and nut type, a triple thread screw of large pitch being used to lessen the wear.

The radiator is protected by being set behind a large channel cross member and is cushioned on 1 in. rubber blocks.

The equipment of the Locomobile truck includes standard equipment, such as tools, jacks, lamps, gas tank and odometer.

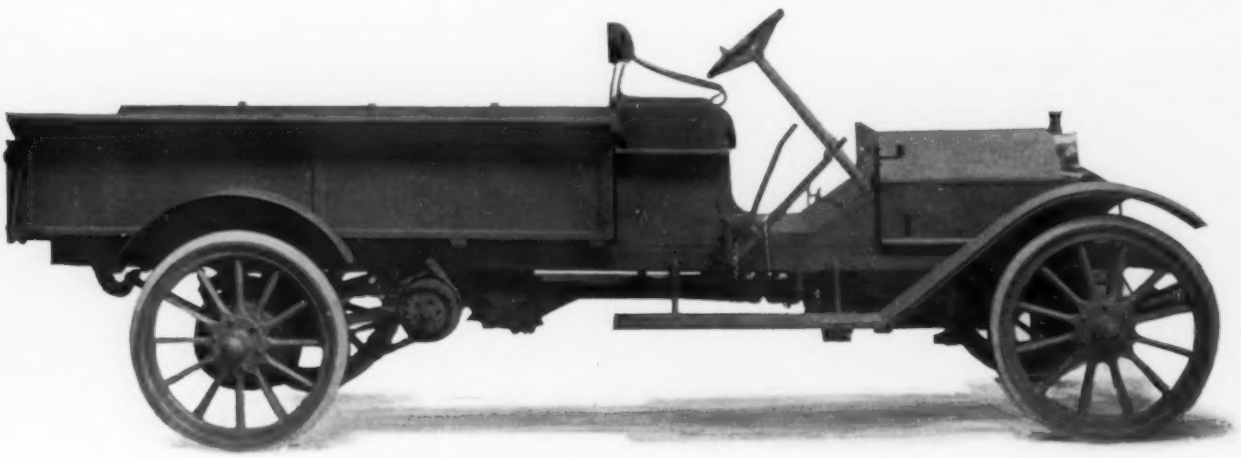
Le Moon One and Two-Ton Commercial Cars

LE MOON commercial cars, manufactured by Nelson & Le Moon, at Nos. 849 to 851 West Kedzie street, Chicago, Ill., are offered for 1912 in two models, a one and two-ton chassis.

Le Moon cars, while possibly comparatively unknown in the East, are well considered in the Middle West. A firm of practical machinists is sponsor for the cars.

Incidentally, it might be well to mention that Axel Le Moon, a member of the firm, drove a one-ton car in the Chicago-Detroit reliability run and the three days' demonstration conducted under the auspices of the Chicago Motor Club, emerging from each event with a clean score. In the former event the work of the Le Moon over the soft sand roads was a matter of much favorable comment on the part of other designers and builders who had cars in the run.

The idea aimed at by this firm is not a large production, by any means, but, on the contrary, limited output of high-class construction.



Le Moon One-Ton Chassis Fitted With Flare-Board Express Body

Le Moon chasses are adapted to all sorts of bodies, and the equipment is furnished at the option of the purchaser. The wheel base of the above model is 130"; tread standard

Le Moon cars are equipped with four-cylinder Rutenber motors, a three-speed transmission, multiple-disc clutch, double side-chain drive.

Four-Cylinder Engines

Both one and two-ton Le Moon cars are equipped with four-cylinder water-cooled engines, of Rutenber make. In the one-ton vehicle the unit is 4 x 4 in. and in the two-ton car 4½ x 5 in. Support is at four points. The cylinders, of course, are cast separately, with integral water jackets. The one-ton engine is rated at 25 h.p., the two-ton at 35 h.p. Piston displacement is 201.06 in the one-ton engine, 318.1 in the two-ton. The pistons are of the usual order and extremely long, fitted with eccentric rings, the fifth of which is placed about the piston pin, so that, should the wrist pin ever work loose, the ring will preclude possibility of wall damage.

The wrist pins are made of seamless steel tubing, hardened and ground. Engine diameter of the one-ton car is 1 in., two-ton 1¼ in.

Connecting rods are drop-forged steel of the usual order, bearings have plain crank-pin ends, fitted with two bolts. The wrist pin is retained in the upper ends of the connecting rod by means of a pinch bolt.

The valves are all located on the left side of the engine and are actuated from a single solid cam shaft through hardened and ground steel rollers operating in guides secured in the crank case. Adjustment of the valves is through the vertical lifters, there being the usual lock-nut device. Engine valves on the one-ton car are 1¾ in. in diameter, two-ton 2 in. Cast-iron guides are forced into the cylinders and provide ample bearing surface for the valve stems. The springs are of the usual type, round-section coiled steel.

Five-Bearing Crank Shaft

As the cylinders are cast separately, a five-bearing crank shaft is used; this, in the one-ton car being 1¾ in., in the larger model 1⅞ in. Inside bearings are 2 in. long on the one-ton car, 2 5-16 in. on the two-ton car; front member 3 11-16 and 3½ in.; flywheel end 3 9-16 and 4 in. respectively. The crank case is forged with an integral flange to which the flywheel is bolted, these wheels being formed with an integral housing which encloses the multiple-disc clutch. Motor bearings are nickel Babbitt.

Multiple-Disc Clutch

The clutch is of the multiple-disc type, the plates housed in the integral case in the flywheel, closed in with a cast-steel plate. There are forty plates in the assembly and the member is worked in the usual manner, through a foot pedal. The plates operate in oil, and are all of steel and concaved in shape, which makes engagement gradual and smooth.

Thrust is taken up through a ball member and, to eliminate spinning after disengagement, a brake, carried on the thrust collar, is brought into play by contact with a similar member on the rocker shaft.

Three-Speed Transmission

The connection between the multiple-disc clutch and the transmission, which is a three-speed selective sliding-gear set, is a universal-jointed propeller shaft 1 5-16 in. in diameter, which is housed in a steel tube, the tube fitted at the forward end with a yoke, as will be noted in the chassis illustration. Much of the stress is cared for through this tube,

though there are, in addition, the usual side thrust or radius rods extending from the jack-shaft brackets to the rear axle. Gear face is 1 in., pitch 6-8, main shaft being 1⅜ in. diameter, formed square and equipped with New Departure bearings. The countershaft is 1½ in. in diameter and the jack shaft of like dimensions, fitted outboard with Hyatt bearings.

The differential bevels are 1¼ in. face, master bevel 1¾ in. face, driving pinion 1¾ in. face. The driving pinion and its shaft are formed separate. New Departure bearings are used and serve as thrust members as well.

The gear box and the differential housing are formed in a single section of aluminum, the jack-shaft tubes being secured to cover plates which are bolted to place. The construction presents nothing unusual, but rather that which is well known and accepted as standard. The jack-shaft tube supports are heavily webbed. The transmission case is also heavily ribbed.

Final drive is through side roller chains, ⅞ x ⅝ x 1¼ in.

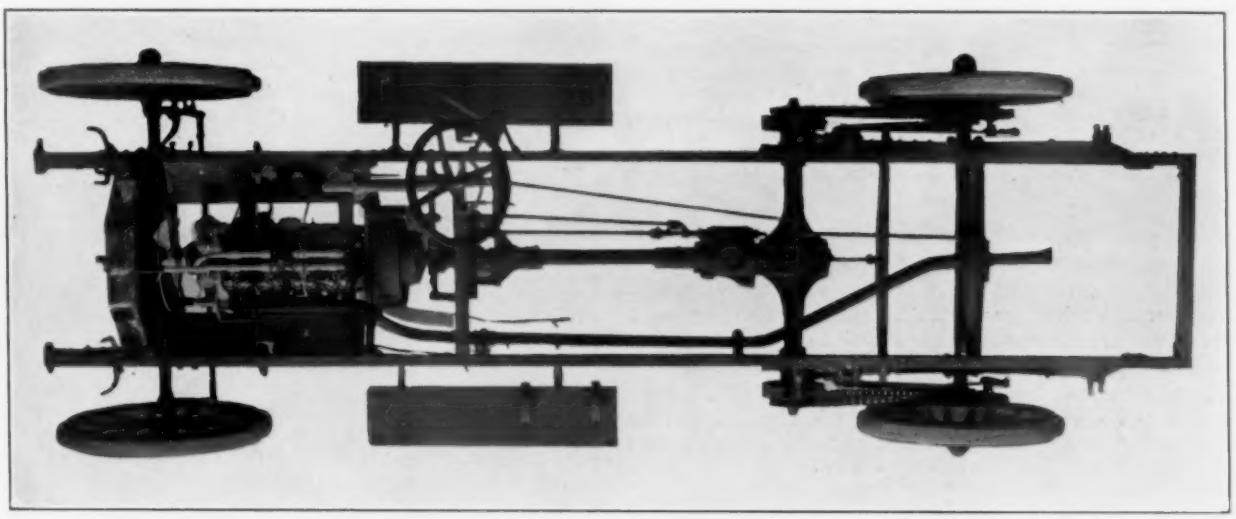
Springs

Front and rear springs are semi-elliptic, a jack spring being fitted at the rear, this designed to take hold when two-thirds of the load has been placed in the car.

The front springs have seven leaves; overall length 36 in., plates 2 in. wide. Spring bolts are nickel steel. Spring material is chrome-vanadium steel. The rear springs, like the front, are lipped and are built up of seven leaves 2½ in. wide, overall length being 42 in. The cross spring, located above the rear axle and retained at center to cross member of the frame, is 34 x 2½ in, seven leaves. This cross set bears at either end on the spring pads carried on the rear axle.

Since the propeller shaft is housed in a steel tube fitted with a yoke and there are the two side radius rods, the springs are not imposed on. The radius rods, as before mentioned, reach from the rear axle to the jack-shaft brackets; these brackets, by the way, not only supporting the rods, but the jack shaft, spring hangers and brakes.

The front spring horns are cast steel, webbed and hot-riveted to the main frame. Spring suspension is along the usual lines.



Top View of the Le Moon One-Ton Chassis

The one and two-ton chasses are identical in construction, with the exception of the power plant. The one-ton model is equipped with a four-cylinder, 4 x 4″ motor, while the two-ton uses a four-cylinder motor of 4½″ bore and 5″ stroke. The motors are of the well-known Rutenber make. Other specifications are as follows: three-speed, selective, sliding transmission; multiple-disc clutch; splash and force-feed lubrication; Bosch high-tension magneto ignition only, on one-ton model, with the addition of batteries on the two-ton; two sets of brakes on rear wheels and jack shaft; right-side steering and control.

Frame

The frame is made of channel steel, 4 in. channel on the one-ton car, there being five cross members. The member is hot-riveted throughout, reinforced by channel plates at frequent intervals.

The cast-steel spring horns are hot-riveted to place.

Wheels

Wheels are wood, artillery type, 36 in. in diameter; front spokes 1¾ in., rear spokes 2 in.; twelve spokes in front and rear wheels. Tires are solid rubber. Wheel bearings are cup and cone ball type, the inner row of balls being 1 in. diameter, outer ⅞ in., Hoffman make being used. Adjustment follows the usual order.

Front Axle

The front axle is a drop-centered nickel-steel forging, 1½ x 2 in., center drop being 3 in. The steering jaws are formed with the axle.

The rear axle is also a nickel-steel forging, 2½ x 2¼ in.

Steering

Steering is from the right side, the post being well inclined to make for easy position, post diameter 1¾ in., wood wheel 18 in. Spark and throttle levers are carried above the wheel on a quadrant. The system is a combination of the screw, wedge and lever and is irreversible. Thrust is taken up through the usual type of thrust bearing, all moving parts being case hardened and ground. The cross connection is a ¾ in. solid steel rod, while the drag link is a 1 in. steel tube, ball and socket joints, adjustable, with springs fitted to absorb shocks. The rod assembly is carried aft of the axle.

Ignition

On the one-ton car the sole source of current is a Bosch magneto, disposed at the right, forward. On the two-ton cars batteries are also used for auxiliary and for starting. Control is in the usual manner, through a switch carried on

the dash—which is locked with a key—and the spark lever on the steering-wheel quadrant. The spark plugs are placed over the inlet valves. The cables are supported in a bracket secured to the water outlet.

Carburetor

An automatic carburetor is fitted on the left or working side of the engine. The manifolds are retained through clamps, which make for quick removal. To provide a tight joint, copper asbestos gaskets are employed. Feed is by gravity, fuel tank being under the driver's seat. Both inlet and exhaust are of large diameter.

Lubrication

Lubrication is force feed with splash. The crank case is formed in two sections parted on the center line of the bearings, the upper half having integral with it the four supporting arms of the motor. The lower section has formed with it a subbase, which contains the oil which is lifted by a gear pump and delivered to the bearings. The pump is driven from the lower end of the vertical commutator shaft. The oil, of course, having attained a certain level, is permitted to drain back to the subbase. The lower ends of the connecting rods also lift the oil in the individual compartments, thus forming the splash. A flare mouth breather is located on the right side of the crank case.

Cooling

Cylinder water jackets, as before stated, are made with the cylinders, the construction being such as to provide ample water-jacketing where it is required. It is to be noted that the exterior walls of the jackets do not taper to the base as is generally the case, but instead are uniform. The water is pumped from the cooler and enters the cylinder jackets through the heads, and after circulation through the jackets is passed outboard through a brass lead and thence back to the radiator. The pump is located on the forward end of the cam shaft.

The radiator, which is of conventional design, is held in the sides of the frame through two ½ in. steel bolts, and to cushion the jar on the member a layer of sponge rubber is carried beneath it on a pressed-steel grid.

Control

Control is standard in the Le Moon one and two-ton commercial cars. As previously mentioned, the vehicles are steered from the right, with the rod assembly placed back of the front axle. Spark and throttle levers are placed above the steering wheel and are operated in the usual manner. The fuel tank is under the driver's seat. The magneto forms the sole source of current in the small car, but there is a battery with the larger as well.

The clutch is operated by the usual foot pedal, and about five pounds pressure is all that is required to disengage the member.

The transmission gears are shifted by a hand side lever; there is the usual H slot or cross-over gate. As the lever is guided from the outer to the inner slot, a lug on the rocker shaft registers with a yoke on the shifting rod shaft. The presence of mud or dirt about the member is not likely to cause the trouble that would ensue if a gear system of shift were employed. The gears are finally operated through steel shift rods and forks in the usual manner.

There are two sets of brakes, in the rear wheels and on the jack shaft. The running brake is on the jack shaft, of the external contracting ball type, 11 x 2 in. The emergency or hand side lever set is located in the rear wheel drum and of the internal expanding type, 3 x 12 in. The brake drums, to which the sprocket rings are secured, are made of cast steel.

Bodies

Le Moon chasses are adapted to all sorts of bodies, and equipment is at the option of purchaser. Wheel base is 130 in. in the one-ton car, and either an 8 ft. or 10 ft. body may be fitted. Tread is standard. Longer bodies are to be had to order. That shown in the accompanying illustration is the regulation flare-board express type.

Use Three-Ton Car For Hauling Coal

Burr Brothers at Brooklands, D. C., near Washington, have found a three-ton White commercial car very useful for transporting coal to customers. The car is shown herewith. Although rated at three tons, four are often carried. The round trip here cited is about five miles and the average speed is 9 m.p.h., the working day being about ten hours. The mileage obtained to a gallon of gasoline is 5¾, and eight thousand miles have been traveled on one set of tires. The front equipment is 36 x 5 single, solid rubber; the rear 41 x 4 dual; and for winter work in which the car is here shown antiskidding devices are employed on the rear wheels. The driver is paid $2.50 a day and the haulage is based at 37 cents per ton mile. The car, according to the owners, does as much work as four horse teams and has frequently been in service all night as well as during the day.

The Driver's Code From the Owner's Viewpoint

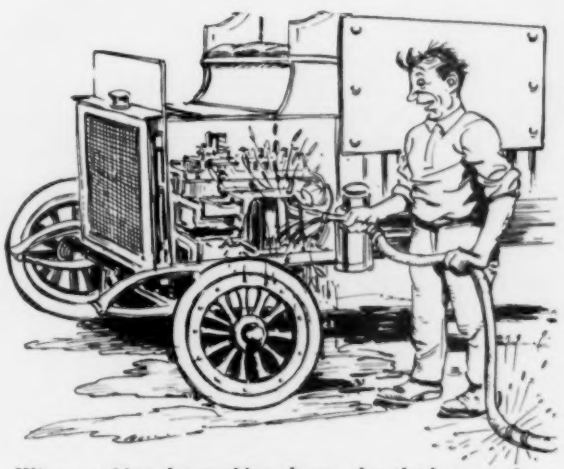
BY E. S. F.

Never wash the car—wait until it rains

Never slow up for crossings or railroad tracks, but see how high you can bounce the load without driving from under it.

When coming home don't miss an opportunity to race a passing touring car, and show what speed the truck has in her.

Drive over all the broken bottles possible and get a commission on the new tires



When washing the machine always play the hose on the magneto—if it won't run wet, it's no good.

Always keep your extra oil cans and oily waste on top of the inner tubes—it softens the rubber and makes them unusually pliable.

THESE ARE NOT JOKES, EITHER—EDITOR

INFORMATION BUREAU

FREE SERVICE

Surely there is something special which nearly every one of our readers would like to know about commercial cars, or their use or care.

Our Information Bureau is ready to reply to all inquiries. Just write us stating fully what you want to know.

Address

Information Bureau,
COMMERCIAL CAR JOURNAL,
Market & 49th Sts., Phila., Pa.

OPERATION AND COST CHARTS WANTED

(212) In your issue of February 15th was shown a table covering the average expense of operating commercial cars, compiled from records of trucks in service.

The company I am with operates many cars of different makes, ranging from 1 to 6 tons capacity. I have been keeping records of the following expenses:

Chauffeur; Helper; Gasoline; Lubricating Oil; Tires; Other Repairs; Road Expense; Garaging; *Miscellaneous; Depreciation; Number of days run; Number of days idle; Average hours in service; Miles run; Average miles per day; Tons carried; Gasoline used; Lubricating Oil used; Miles per gallon. Is it necessary to keep the number of trips?

*License, insurance, chains, other supplies, etc.

Will you kindly give me a table showing how I may arrive at the following costs: Costs per mile; cost per ton; cost per ton mile?

J. M. O'CONNOR.

A very excellent way of keeping accurate records is illustrated on the diagram below which should be drawn up on two forms. One form ruled in columns showing the days of the month from one to thirty-one, and another form ruled in columns with the months of the year. The total column, on the right hand daily form is transferred to the proper monthly column of the monthly form, and the total column in that form will give the total, of course, for the year. On the upper portion of this form is a record of operation, and it may be optional with the truck whether or no all of the items are entered.

A department store for instance may be interested in the number of packages and trips, rather than the number of tons carried. Another concern on the contrary is not interested in the packages or the trips, but would be interested in the number of tons. This also applies to the filling in of a lapse of time and running time and some of the other items, although it would be of interest, probably of value if every item were filled out.

The lower one half of this record tabulates all items of operating expense, and the total footing of any one column will give the expense of the day. This amount divided by the number of miles traveled, which can be found in the operating record, will give cost per mile, and this sum divided by the number of tons carried will give what is known as the cost per ton mile; that is if the vehicle is carrying loads in both directions. If, however, the truck is only used to carry loads in one direction, returning light, the cost per ton mile will be just double the amount obtained by this method.

Such items as license and insurance are ones which are generally paid in advance for the full period of a year, and this amount should be divided at the end of the year by the number of working days, and then added to the daily rate in order to give a proper account.

The item of depreciation is always an arbitrary one. The general practice is to charge off same on 20 per cent., but as this is wholly illogical, we would suggest that a far better method is to assume what the average life of your vehicles may be, represented by anything from 75,000 to 150,000 miles, and depreciation accordingly charged off according to the number of miles traveled, and such amounts can be added to the various columns and considered in estimating the cost per mile or per ton mile, as the case may be.—"Editor."

OPERATING RECORD	1	2	3	4	5	6	7	8
Number of tons								
Number of miles								
Number of trips								
Number of packages								
Miles per hour (aver.)								
Elapsed time								
Running time								
Time out of service (acct. accident or repair)								
Number of stops								
Gasoline, miles per gallon								
Oil, miles per gallon								

OPERATING COST RECORD								
Driver's wages								
Helper's wages								
Additional Help								
Garage								
Washing and Polishing								
Tires								
Gasoline								
Oil and Grease								
Parts replaced(not through accident)								
Parts replaced through accident								
Ferriage and Tolls								
Insurance								
Road expense								
Body repair or repainting								
Other expense								
TOTAL								
Cost per mile								
Cost per ton-mile								

AN ADVOCATE OF STEAM ROAD TRAINS

To the Editor:

Tractors and trailers are well worth the attention which you have been giving them in recent issues of your journal.

I do not, however, entirely agree with Mr. Foljambe in advocating the use of motor trucks with trailers. Unless the truck is specially designed to haul a trailer, it is strained by the additional load and by excessive operation on intermediate gears. Unless a trailer is specially designed for use with a motor truck, it will undergo excessive depreciation at the high speed at which the motor truck is driven. Furthermore, the principal advantage in the use of trailers is not enjoyed—namely, that of permitting the high-paid operator and the expensive power plant to be busy during loading and unloading.

Ton-Miles the Criterion

The criterion of the usefulness of a mechanical outfit is neither its speed nor its load, but the product of the two, the number of tons it will haul one mile in an hour. A standard three-ton truck can average ten miles per hour, thus accomplishing thirty-ton-miles per hour. The addition of a two-ton trailer would increase the paying load to five tons, but would reduce the average speed to about six miles per hour. Hence nothing would be gained in performance and much might be lost in extra depreciation of both motor truck and trailer.

Steam tractors have been so successful in Europe for the past thirty years that I feel confident that they will be widely introduced for heavy haulage in this country.

ROBERT L. NILES, JR.

HAULAGE WITH TRACTORS AND TRAILERS

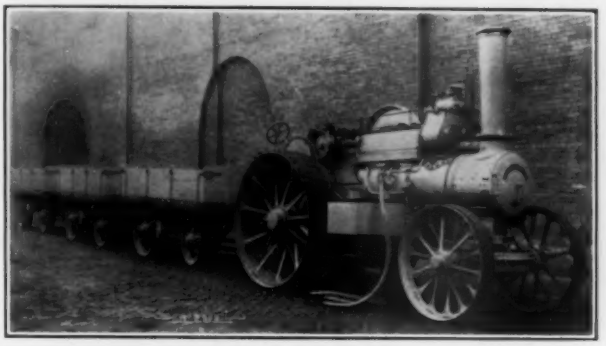
If a large tonnage of material is to be handled over rough roads the most efficient means of transportation is the road train, drawn by a tractor.

In choosing a motive power for the tractor it would be natural to seek that possessing the characteristic of the horse; simplicity, reliability, and the ability to develop a maximum pull when standing still.

The importance of this last characteristic was not appreciated until the pioneers in electric traction endeavored to operate horse cars with 5 h. p. motors. While such motors were adequate to keep the car moving when once in motion, they were incapable of getting the car under way. In the handling of road trains this question of maximum starting pull is of the greatest importance.

Of the three types of motors with which the tractor can be equipped, the internal combustion engine least resembles the horse. It is complicated, delicate, and not always reliable. It develops a decreasing pull as it slows down, and no pull when standing still. Being the "thoroughbred" of motors, it is best adapted to the driving of pleasure and light commercial vehicles.

The Fowler Steam Tractor
The tractor is of five tons capacity, with six-ton trailer, giving thirty ton-miles per hour



Typical English Steam Locomotive With Trailers
The combination of this nine ton road locomotive with four-ton trailers gives a carrying capacity of sixty ton-miles per hour

The electric motor possesses the desired characteristics of simplicity, reliability, and most important of all, the capacity of developing a heavy torque at low speeds, and a maximum torque at zero revolution per minute. When dependent for its supply of energy upon a storage battery, however, its range of activity is limited.

The steam engine is the simplest and most reliable of all motors. It develops an increasing pull as it slows down, and a maximum pull when standing still. Under all conditions it delivers its power elastically, never with shock or jar. It is well adapted to use on a tractor, since weight is needed to give traction, and the steam engine proves most satisfactory when of generous proportions, and when supplied by a boiler of large size.

Thirty years' experience in England has led to the development of a steam tractor which holds its own against all the modern types equipped with internal combustion engines.

A steam tractor can handle with ease two six-ton trailers at five miles per hour, accomplishing sixty ton-miles per hour. Dividing this by the capacity of any motor truck, it is seen that the corresponding speed is excessive. Thus, a five-ton truck would have to average twelve miles per hour to do the same work.

Granted that there is a sufficient amount of material to be handled, the only limitation to the use of a road train is the number of trailers which it is permissible to haul in any given locality.

The following may be taken as standard loads:

Team	2 tons
Motor Truck	3 tons
Steam Tractor	12 tons

Since the first cost of the tractor and trailers is the same as that of a five-ton truck, and the daily operating expenses but little more, the item of cost alone—not to mention those of greater simplicity, reliability and capacity for heavy haulage—places the steam tractor for this kind of work ahead of its "up-to-date" rival.

Under road and grade conditions which permit a team to handle four tons, six-ton motor trucks may be operated successfully, and a tractor must haul twenty-four tons to work at full capacity. As such conditions are found in the city, and as twenty-four tons require the use of four trailers, it is evident that all city work belongs to motor trucks.

The class of haulage to which each type of machine is best adapted is given in the following table:

Amount of Material To Be Handled	SMALL		LARGE	
Length of Haul	Less than 10 miles	More than 10 miles	Less than 10 miles	More than 10 miles
Easy Grades and Good Roads	Electric 3 ton	Gasoline 3 ton	Electric 5 ton	Gasoline 6 ton
Heavy Grades or Good Roads	Electric 3 ton	Gasoline 3 ton	Tractor with two 6 ton trailers	Tractor with two 6 ton trailers

NUMBER OF AUTOMOBILES IN USE

[211] We are desirous of ascertaining the number of automobiles there are in use, or in other words how many licensed cars there were in use last year in the United States. If you have statistics showing the number of automobile manufacturers there are in the United States, we would be quite pleased to have that.

St. Louis, Mo. Curtis Jack & Truck Co.

Registration statistics show 523,384 registrations up to 1911, and it is safe to estimate that this figure is now over the 600,000 mark. In regard to the number of automobile manufacturers, there are about 325 to 350 pleasure car makers, some of whom, however, are not very active and cannot really be counted as producers. There are about 240 commercial car builders of which about 210 can be considered as active.—E. S. F.

If you want any advice either in reference to the cars you are using or the best methods to follow in order to produce certain results, or if you desire information of any kind, relative to the commercial car industry, kindly write to us and we will give you all the assistance possible. Address Editorial Department, "C. C. J.," Forty-ninth and Market Streets, Philadelphia, Pa.

Alco Truck Loading Up With Tarvia

One of the eleven Alco trucks purchased by the Barrett Manufacturing Co., of Boston, which has a capacity of one thousand gallons of Tarvia and hauls material from reservoirs in Boston to near-by towns where roads are being treated. This truck is operated at the cost of about $12.50 a day, which figure includes gasoline and oil expense, driver's and helper's wages, depreciation of the truck and tires, insurance, and incidental expenses. During one month of twenty-two working days this truck covered 1187 miles, hauled 190 tons and made 38 trips per day, which figures to a daily average of 54 miles; 8.64 tons; and 135 ton-miles. The next month this car carried 165 tons, traveled 1246 miles and made 33 trips covering more distance but aggregating less tonnage.

Pittsburgh, Pa. The City Council of Meadville has passed a resolution calling for the purchase of an auto fire engine and a motor hose wagon. The wagon will be of not less than 60 h. p., and will be used in the hilly districts of the town. It will cost from $6000 to $7000. There is much valuable property in the hilly district, and the Councilmen believed that a motor wagon would be of much greater service than the horse-drawn vehicles.

An effort is being made among motor truck manufacturers to adopt certain designs of truck bodies as standards, and to refuse to manufacture others except upon special orders, and at advanced prices. Those who advocate this change believe that about a dozen standard forms of bodies would cover every important purpose.

Gramm Trucks In Russian War Department Service

The above photos show some of the Gramm trucks of the Gramm MotorTruck Company, Lima, Ohio, in use by the Russian War Department. The machine filled with soldiers is now in service in Persia. Ten of these trucks were recently sold to the Russian War Department by H. W. Goddard, Sales Manager of the Gramm Motor Truck Company, the cars being handled by M. S. Friede, the St. Petersburg agent, who has twenty-seven subagents in various parts of Russia.

Some of the Leading Lights of the Automobile Industry

M. L. PULCHER

M. L. Pulcher's connection with the automobile business dates back to 1907, when he was one of the organizers of the Oakland Motor Car Company, at Pontiac. This he ran until 1909, when he sold out to the General Motors, being retained as secretary and treasurer of the Oakland plant at Pontiac. Believing, however, there was a wonderful future for the motor truck industry, he went after the commercial car by organizing, on July 15, 1910, a small company as the Federal Motor Truck Company, built his models, ran them out carefully, then began to manufacture in a small way. This company today is manufacturing five-hundred one-ton Federal trucks per year and has purchased a new plant with additional ground to build a plant three times its size and are in shape at this time to build a quantity of trucks.

M. L. Pulcher, General Manager and Purchasing Agent, Federal Motor Truck Company.

J. T. Langhorne, Manager Truck Sales Department, Packard Motor Car Company.

WILL H. BROWN

Will H. Brown is still a young man, although he has come down the highway of life "on high gear." He lives in Indianapolis, Ind., but his horizon is much larger than the city limits. Indiana claims to have more automobile factories than any other State in the Union, and of all the prominent gasoline devotees in this State, none rank higher than "Booster" Brown.

When the automobile was a toy—only a few years ago, Brown was a pioneer in the new era of conquering the problem of locomotion. He was so energetic that carpenters could not build factory buildings fast enough for him, so his first cars—pleasure cars—were built in tents pitched along the banks of White River. With D. M. Parry he established the Overland Automobile Company, and later became vice president of the Willys-Overland Company and general manager of the Overland and Marion factories in Indianapolis, Ind. May 1st, 1911, he became president of the Mais Motor Truck Company, having resigned from the vice presidency of the Willys-Overland Company.

Will H. Brown, President and General Manager, Mais Motor Truck Company.

When Mr. Brown quit the pleasure car manufacturing business to build Mais trucks, just to show how far and effective his reputation is for quality goods and selling ability, automobile agents all over the country wrote, saying, if Mr. Brown took the wheel of the Mais, that was enough to satisfy them of its merits.

Mr. Brown is noted also because of his attitude on capital and labor. He is the originator of many fine selling plans and cost-saving systems. His methods of handling employes is well known. His is the "family spirit" method. Everybody in his concern speaks of it as "ours" and "we." Besides making a wonderful reputation and success of his business, he has always been found willing to shoulder his share of responsibility in all civic activities. "If you want anything done, get a busy man to do it." This theory has caused Mr. Brown to be in big demand.

J. T. LANGHORNE

Like most of the "Leading Lights" of the automobile industry, J. T. Langhorne, manager of the truck sales department of the Packard Motor Car Company, was a light in other lines of business before taking up the automobile. Away back in the early days in St. Louis when the adding machine was known as an "arithmometer" he entered the business as an office man. For eighteen years he steadily climbed the ladder until he became assistant general manager. Shortly after this he went to Europe as general manager of the Burroughs Foreign Company. After showing his associates how to slip over something new and up to date on an Englih business man, and having festooned most of the counting houses of England with ribbons of printed figures, he came back to this country and for seven years was president and general manager of the Pike Adding Machine Company, of New Jersey. Having become enamoured of the automobile, particularly trucks, he sold out his interest in the adding machine company, and joined, in June, 1910, the Packard Company, as manager of the truck sales department.

Country Hauling With a Motor Truck

BY REX BERESFORD

The motor truck for city hauling is no longer an experiment. Its use has become established with many firms as a paying proposition wherever heavy hauling for long distances is to be done. Another place where the motor truck is proving successful, though not so widely known, is in country hauling. The motor truck pays best where the distances are long, the loads heavy and the time element an important factor. Where quick transportation of heavy loads for long distances is necessary, the truck does the work more cheaply and satisfactorily than do teams. This applies especially to hauling on country roads, between inland towns and railroad points or between towns having poor railroad connections.

Fig. 1. Avery Truck Hauling Milk and Cream at Millard, Neb., Using an Old Horse-Drawn Truck as a Trailer. This truck and one extra man do the work formerly done by four men and four teams

Take the town of Urbana, Ia., for instance. Though this little city is situated in the heart of one of the finest agricultural districts of Iowa, with no town nearer than eight miles, it is also ten miles from the nearest good shipping point. Its stores do a good business, but all the goods, building materials, coal and other supplies have to be freighted from the surrounding towns. A motor truck engaged in passenger or freight service here could be made a mighty paying business and a great convenience to the citizens of the town as well.

Again there are often towns near enough in miles "as the crow flies," but far apart by railroad. Vinton, the County Seat of Benton County, Ia., is situated on the Chicago, Rock Island and Pacific Railroad. It is only about twenty-two miles from Belle Plaine on the Northwestern Railroad, but to reach one town from the other over fifty miles of railroad travel is necessary. This also involves a full day of short rides and exasperating waits. Both passenger and freight hauling by motor truck fitted for travel on country roads could be made to pay well here.

A number of Avery trucks fitted with their perforated cast steel rim wheels are operating in such locations. E. T. Williams, of Owensville, Mo., is doing such a freight and passenger business as has been suggested, between the towns of Owensville and Herman, Mo. Another truck owner, Frank Bay, of Hibbing, Minn., has his two-ton Avery truck fitted with a 'bus body capable of holding from fifteen to eighteen passengers, and operates this in place of the old time stage, in the iron range between the towns of Chisholm and Hibbing, Minn. Mr. Bay has made as high as $125 in one day in fares and totaled $624.35 in one twenty day period.

Mr. Rexroth, a drayman in Vermont, Neb., has an Avery truck with which he hauls furniture and other freight to and from neighboring towns. He makes frequent trips to Omaha, thirty-eight miles distant, hauling freight. This method of delivering goods appeals to the shipper and buyer alike, because it saves the transfer both to and from the car, saving drayage and rough handling at both ends of the line.

The motor truck is also making good in the country with the small miller or manufacturer in the inland towns, or where situated at a considerable distance from market, and yet not so far away as to make railroad shipment profitable. Up in Minnesota, The Hanover Rolling Mills are using a three-ton Avery truck with perforated cast steel rim wheels for hauling flour from Hanover, an inland town, to Minneapolis and other points. They make the round trip of fifty-four miles hauling two and one-half to three tons, in eight hours on from sixteen to eighteen gallons of gasoline. This formerly took two teams from two to three days. Ernest Meyer, of Oak, Neb., also hauls flour to his customers in all the surrounding towns in a radius of fifty miles. He uses an Avery truck with perforated cast steel rims, and considers that in his business he could not afford to be without the truck.

The Swansea Artificial Stone Company, Belleville, Ill., is another manufacturing concern that uses the Avery truck for delivering its output. This company makes deliveries of drain tile and stone throughout the surrounding territory.

Fig. 2. Avery Truck Hauling Flour in Oklahoma. Note the character of the road over which the truck is passing

These instances also illustrate one of the advantages of the motor truck over railroad delivery, when made within reasonable distances. The use of the motor truck saves at least two and sometimes three transfers in such hauling. This means a saving of twice handling of the goods and two sets of teams, one at each end of the line. This saving in handling is of special value in such industries as tile and brick manufacturing, where heavy loss by breakage occurs in handling and shipping.

The saving in transfers and in time are particularly valuable in making deliveries of milk and cream to creameries, either from farms or cream gathering stations. J. F. Wheeler, of Millard, Neb., uses an Avery truck for hauling milk. He hauls milk to Omaha, making a trip of thirty miles every day, besides this he hauls oil, making his total average daily run reach fifty miles. With an Avery truck and one extra man he does the same work that four men and teams formerly did, saving in wages and the cost of keeping the team $160 each month after the cost of operating the truck is deducted. Mr. Wheeler's profit for one month, November, 1910, after deducting his drivers' wages, was $404.87. In every district there is a storage and distributing point for oil and gasoline. From it oil is hauled across country to the neighboring towns, keeping four to eight horses busy the year around. Out in Jennings, Kan., Mr. Parsons is using a three-ton Avery truck with which he hauls oil between Jennings and Oberlin, and other towns. The trip of twenty-two miles and return between Jennings and Oberlin, which formerly took a long day with four horses and cost of $10. Mr. Parsons now makes in eight hours, counting the time of loading and unloading, and the cost is in actual cash, not counting up-keep, interest and depreciation, $1.55. There are also a number of other Avery trucks engaged in hauling oil, as a business.

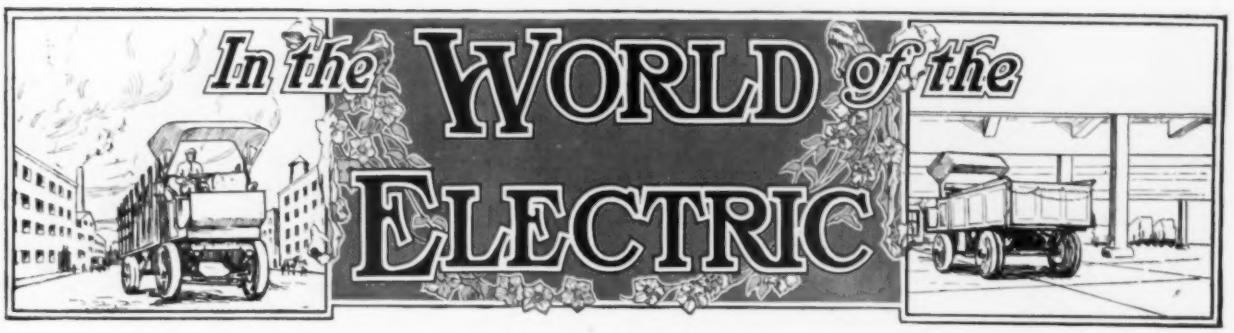
Hauling supplies for large farms and freighting in the produce of farms and ranches, such as grain, wool and hay, also furnishes employment for a number of motor trucks, and would take many more if their value and the saving they make possible were better known.

G. B. Pope, of Miles City, Mont., is using an Avery truck with perforated cast steel rims for the purpose of hauling from his ranch to Miles City, a distance of fifty-three miles. He states that this work is being done at about one-half the cost of doing the same work by horse power, and that the truck is saving money for him.

An Avery three-ton truck fitted with their special country road wheels is doing daily service for B. E. Baker of Duluth, Minn. Mr. Baker's farm is located near Spooner, Wis., and the truck makes at least one round trip of twenty miles with occasional double trips, every day except Sunday. From two to four tons are hauled each way over hilly and sandy roads. The trip is made on five gallons of gasoline. Mr. Baker estimates that the truck is doing the work of three teams and of three men at the cost of one man and one horse. This work was done through the hottest weather also, when hauling with horses had to be done at night or cease entirely, because of the heat.

All these trucks are able not only to haul loads themselves but to pull trailers as well, making it possible to haul from eight to ten tons at one trip. When fitted with extension rims they can do plowing and other field work as well. They are also fitted with a drive pulley and can furnish power for belt work at need, making what has been termed a "versatile" power wagon.

Fig. 3. Three-Ton Avery Truck Hauling Tile in Canada, With Two Trailers. Note the unusual type of tires used on the truck. These consist of hardwood blocks for use on dirt roads



Report of Monthly Meeting of Electric Vehicle Association of America

At the last meeting of the Electric Vehicle Association of America in the Engineering Society's Building, New York City, March 26th, the paper of the evening was "Efficient charging of Electric Automobile Batteries," by J. F. Lincoln, vice-president of the Lincoln Electric Company, Cleveland, O. The meeting was unusually well attended and many took part in the discussion which followed the paper. As usual, President Blood presided. Extracts of the paper are herewith given:

EFFICIENT CHARGING OF ELECTRIC AUTOMOBILE BATTERIES*

The efficient charging of electric batteries for automobile purposes in the usual garage is very much complicated because of the following reasons:

First: The batteries in the cars which are now in actual operation require a voltage which on the smallest number of cells is 30 and on the largest number of cells about 120. Practically all the intermediate voltages are needed.

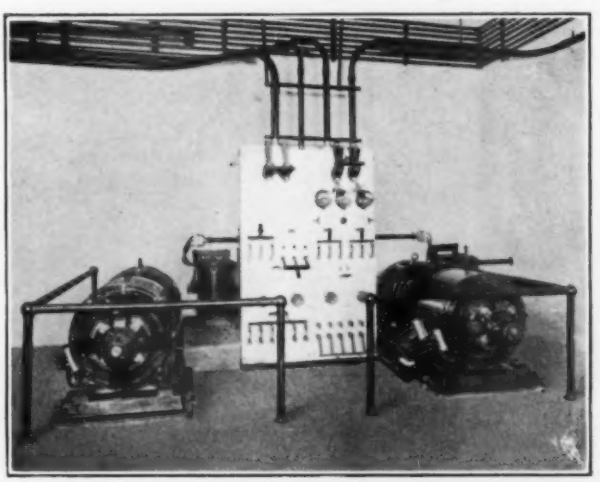
Second: The rates at which these batteries are to be charged on the usual passenger or pleasure vehicle will vary from 15 to 60 amperes.

The usual method of taking care of these different voltages is to get a single voltage, usually 125, which will certainly be high enough to charge any of the batteries, and then by the use of a rheostat reduce this voltage to the voltage that the battery requires. The great drawbacks to this scheme are the fact that there is a loss in the rheostat varying from 5 per cent to 80 per cent and there is also no chance for the battery to get a tapering charge unless closely watched by the operator, and since the tapering charge on the lead batteries is indispensable for the best operation of the battery it usually means that the life of the battery and its mileage is very rapidly decreased.

One of the most usual methods of increasing the efficiency is to charge two or more batteries in series on the 125-volt system. This will certainly increase the efficiency, as it charges twice as many cars with the same power expenditure as would be the case if but one car was charged on the same circuit. The difficulty with this scheme, however, is the fact that it is almost impossible in actual practice to get two cars of equal size of battery and of equal state of discharge that can be put on at the same time. It naturally follows, then, that the garage operator will take any two cars that happen to come in at the same time and put them on in series. One car of these two will have had a greater discharge than the other, and, therefore, this car should be charged at a higher rate than the one which has been discharged to a less degree. Of course this is impossible, and the car which has had the greatest discharge generally decides the rate at which the new charge will be put in. This results in a very rapid charge for the car already partially charged and also does not give it the tapering charge at the end which is so important for mileage and life. These two difficulties are so pronounced that in every high class garage at the present time series charging for lead batteries is never used, and it would not be done in any garage if the owner of the car knew how harmful such charging is as it is usually carried out.

With the mercury arc rectifier it is necessary, of course, to charge cars in series, this series sometimes being as high as five cars on a line. This system, of course, is just that much more destructive than having two in series, since it is commercially impossible to get five cars which are like enough in their discharge so that the charging rate on all five cars can be made the same without harm to one or more of them. The cost of tube breakage is apt to be excessive in the usual garage, partly on account of inexperienced labor and partly on account of the frail nature of the tube itself. There is also added to this the annoyance and possible expense of a shut-down, necessitated by the tube breakage.

On account of the wide diversity of voltages required it will be necessary for the ideal charging system to deliver a multiplicity of voltages, these voltages to be but very little higher than the maximum charging voltage for the battery. In series with the battery there should be placed a small ohmic resistance which will automatically cause the charging rate to decrease as the charge goes on, consequent on the rising voltage of the battery. It will also be necessary to have this rheostat so arranged that any rate can be given the battery from 5 to 60 amperes without danger to the rheostat. It would also be necessary for the best practical operation to be able to read at one or more central panels the state of charge and rate of charge of each battery in circuit. With an outfit such as this, the smallest possible amount of power will be wasted, thus giving the largest possible efficiency. There would also be no necessity for many operators, since there

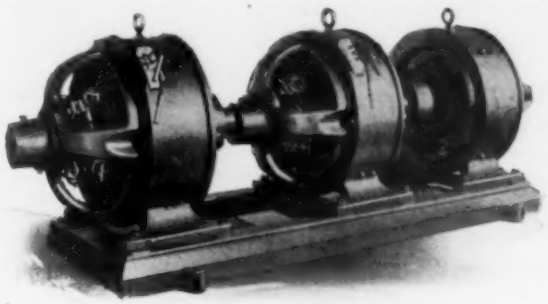


Seventy-five and 115 Volt Motor Generator Sets in a Cleveland Garage

*Extract from a paper read by J. F. Lincoln, before the Electric Vehicle Association of America, on March 26, 1912.

would be no shifting of cars to be done, since all readings could be taken from a central panel.

To fulfil these requirements, special pieces of apparatus especially adapted to this work have been designed. They are, primarily, when the supply is alternating, a motor generator set, the generator giving two voltages, one of them being 105 and the other 70. Direct connected to this generator is a small double



Three-Machine Balancer Set For Splitting Supply Voltage Into Three Parts

commutator booster whose fields are excited from the 105-volt generator, thus giving it a constant excitation, two windings on the armature being so arranged that when turning at the speed of the motor generator set they will deliver 5 volts. With this outfit it will be possible to add to or subtract from the voltage of the main generator this 5 volts. In this way the voltages actually given will be 65, 70, 75 and 80, also 100, 105, 110 and 115. Another feature of importance is the fact that positive or negative boost from this small booster will be taken from opposite sides, that is, from one side in the case of the 105-volt commutator, and from the other side in the case of the 70-volt commutator, so that the size of the small booster can be made very small in comparison with the size of the main generator.

The majority of cars in operation at the present time have the following batteries: 24, 26, 28, 30, 38, 40 and 42 cell lead, and 24, 40 and 60 cell Edison. 95 per cent of all cars in operation at the present time have one of these combinations of batteries in them. The only other ones in use are a few old type machines which have 12, 14 and 16 cells. The number of these, however, is so small that they can be practically eliminated. The voltages necessary to charge the batteries named above are as follows:

24 cell lead	62½ volts		40 cell lead	104	volts
26 " "	67½ "		42 " "	100	"
28 " "	72½ "		40 " Edison	74	"
30 " "	78 "		60 " "	110	"
38 " "	90 "				

It will therefore be plain that with this charging outfit mentioned, all of the usual batteries now in operation can be charged direct from this multiple voltage system without a loss which will exceed a maximum of 5 volts and which in actual practice will have an average of considerably less than 2 volts. This means a saving of from 2 to 50 per cent over the single voltage system which is so often used. This also will allow all batteries to be charged in parallel, which is a very important feature. Another thing which is of especial importance is the fact that since there is a very small resistance in series with the battery, as the charge of the battery increases the charging rate will automatically taper off on account of the increasing of the battery voltage, thus giving automatically an ideal charge to the battery. Another feature is the fact that on account of the very small loss in the rheostat, the size and cost of the charging rheostats can be made very small, very much smaller and cheaper than is possible to make a rheostat which must take care of voltage drops of from 40 to 50 volts, which would be absolutely necessary in the case of the single voltage system.

Let us now consider the relative cost of installation of the single voltage system and of the multiple voltage system comparatively. The kilowatt capacity of the multiple system to do a certain amount of charging is a great deal less than the kilowatt capacity necessary on a single voltage system. The reason for this is plain, since on a multiple voltage system practically all the power generated is used as useful charging current and put into the battery, while in the case of the single voltage system a great part of the power generated is dissipated in heat in the charging rheostats. As an example of this we cite the following:

The kilowatt capacity necessary to charge ten 24-cell and ten 40-cell cars at one time at their full ampere rate is on the "Lincoln double voltage system" 26 k.w., while on the single voltage system the power necessary would be approximately 40 k.w., which, in other words, means that the 14 k.w. out of this 40 k.w. is dissipated in heat in the rheostats, while but 26 k.w. is used in useful charging current. If in this example we had used a larger percentage of low voltage cars the difference would have been even greater in favor of the multiple voltage system, or, taking a concrete example, if two of the cars are 40-cell and eighteen of them 24-cell, the capacity to charge them on the multiple voltage system is 26 k.w., while on the single voltage system it would be 50 k.w., meaning that 24 k.w. out of the 50 k.w. generated would be dissipated in heat in the charging rheostats. Another feature which reduces the cost in the multiple voltage system is the fact that since there is but a very small amount of heat to be dissipated in the charging rheostats, therefore this rheostat can be very small and have a much lower cost than if a large amount of power was dissipated.

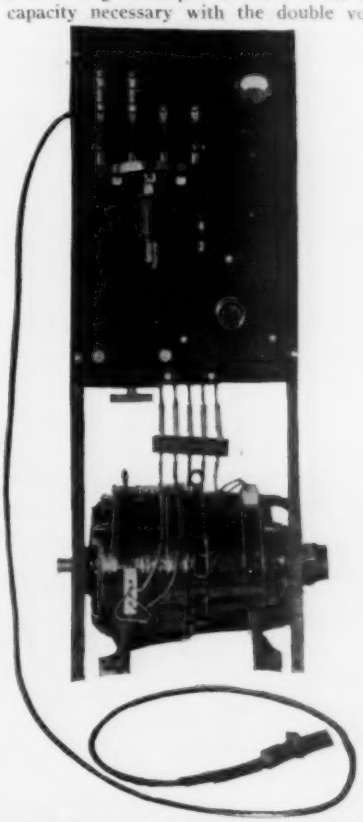
The cost of charging in the usual garage is a very large item in the actual cost of operation. It is evident, therefore, why it is that a great many garages insist that it is impossible to make an electric garage a paying proposition.

It might be well to take an example of a certain garage to show just what the power and installation saving would be. It is already seen that the first cost of installation on account of the smaller kilowatt capacity necessary would be less than the single voltage system. Now let us consider what the cost of operation would be.

There is a garage in one of the large Western cities which has the following cars which are charged every night:

55—28 cell
22—24 "
6—40 "
18—24 "
3—40 "

The capacity necessary to charge these batteries at their full rate, providing they are all put on at one time, would be with the single voltage system of 200 k.w., and the cost of putting in a charge, providing the batteries of all these cars were exhausted, would be at a rate of 3 cents per kilowatt hour, approximately $58.00. The capacity necessary with the double voltage system

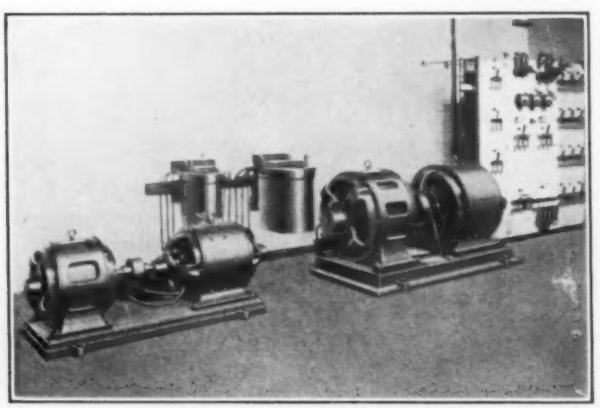


Variable Voltage Individual Car Motor Generator Set With Automatic Panel

will be 153 k.w., and the cost of putting a charge into these cars with the "Lincoln multiple voltage system" would be $34.00. The cost of installation of these two systems would be as follows, including distributing panels, rheostats, wiring, etc.: "Lincoln double voltage system" would be approximately $6500, while on the single voltage system the cost would be $9000, so that the operator would not only save 30 per cent on his first investment, but he would also save approximately 40 per cent in his charging cost. At the same time he would be able to handle his garage with less help and would be able to take readings and taper his charges with less than half the attention which would be necessary with the single voltage system.

If the supply current is direct instead of alternating the problem is changed to a great extent. Almost all direct-current supply, if from the central station, is three wire, giving 115 and 230 volts. The usual method of charging from this system is to either charge three cars in series on 230 volts, with the resulting harm of series charging, or to charge all cars in parallel at 115 volts, which means a large loss of power in the charging rheostat. It therefore becomes plain that there is a considerable chance not only for more efficient charging, but also for more efficient charging by getting the actual voltage, which will be necessary for each particular battery. It is more easily taken care of, however, than it would be if the supply were alternating. The best possible scheme to do this would be to put in a three-machine balancer, cutting up the voltage into the following voltages: 75, 80 and 80. Then direct-connect to this the booster so that the positive and negative boost can be given to any circuit. In this way it will be possible to get the following voltages: 60, 65, 70, 75 and 80. The 115-volt current can be gotten directly from the circuit from the neutral outside supply line. In this way extremely efficient working can be gotten and also parallel charging. This means, in the usual garage, a saving of from 20 to 30 per cent over the method which is usually used for this work and you also have the advantage of having a small and cheap rheostat and the added advantage that the battery will automatically taper its charge.

In the case of the single car charging in the private garage, there are at the present time a great many rectifiers used for this work. The reason for the use of these rectifiers, as a general thing, is the fact of their very high electrical efficiency. There is not the slightest doubt that they are, electrically, a great deal more efficient than a motor generator set. In some cases this will be as much as 15 per cent. However, the cost of tubes for the usual private garage is so high that the small difference in electrical efficiency is more than over-balanced by the necessity for changing of tubes and by the inconvenience of shut-down. Another thing is that the rectifier can never be relied on to cut off at the proper time, unless the line voltage happens to be constant, which it never is in the usual outlying district when supplied with central station power. The cost of replacement of a 50-ampere tube is approximately $30.00. This includes the expressage on the tube and the electrician's time in replacing it. This is guaranteed by the company to last 600 hours; therefore the cost of operation per hour of the tube is 5 cents. The total power going through the tube on the usual lead battery is 2 k.w., which at a 5 cent rate costs 10 cents or, with the addition of the 5 cent depreciation of the tube, the net cost of charging is approximately 15 cents per hour. The cost of the motor generator set to deliver the same amount of power would be 12 cents for this, taking into consideration also a difference of 20 per cent in electrical efficiency, which is considerably more than the actual difference in electrical efficiency. The usual owner of a passenger or pleasure car is not nearly as much interested in a possible saving of a few cents one way or the other as he is in the ability of the car to keep in operation. The occasional shut-down owing to the breaking of a tube means the loss of one or more days' use to him, which costs him considerably more than the few pennies difference in the cost of charging.



Twenty and Seventy-Five K. W. Double Voltage Sets at Cleveland, Ohio

In the discussion several members took exception to points in the paper. Mr. Harris, in his remarks, said that it was possible to get a tapering charge with a rheostat by simply not touching it, and exhibited a curve. This current curve showed the voltage starting in at 97 and finishing at 116, making 90 per cent. efficiency for the charge.

Mr. Lincoln stated that in regard to the efficiency of the motor generator set, the statement he made was, that on a single car motor generator set the efficiency would be about 72 per cent., on a larger motor generator set in a large garage the efficiency can be gotten up as high as 82 or 83 per cent. on 50 kilowatts. Under these conditions the rectifier will not show any better efficiency.

Mr. Harris stated that he did not believe it possible to make a motor generator set so it would be capable of voltage regulation from 60 to 125 through field regulation by the scheme proposed by the author of the paper, without disturbing both systems. Mr. Brackett, of the Western Electric Company, read parts of a paper covering very thoroughly the questions pertaining to rectifier charging.

Mr. Russel called attention to the fact that Gimbel Brothers are getting an average life of 900 hours, and that individual tubes had exceeded the 3000 mark, also that if rectifiers are used one or two tubes can be out of commission without crippling the charging ability of the garage. Whereas with a motor generator set if anything happened the garage would be down and out. Mr. Ford, in answer to a question of President Blood's, stated that he did not think the battery people cared very much whether rectifiers or motor generators were used, or alternating or direct current, providing you put in a certain number of ampere hours in your battery at a certain rate.

Mr. Lloyd recommended the adoption of the 44 cell standard lead battery and 60 cell standard Edison battery, and 115 volts on the line, and called attention to the very high efficiency as shown by the curve of Mr. Harris in charging a full sized battery on a 115 volt line, also that the actual loss in the rheostat is comparatively small. He bemoaned the fact that people continue to use low voltage batteries necessitating the provision of such currents. He asked for more light on the actual advantage of using low voltage batteries.

Mr. Maxwell called particular attention to the efficiency of series rheostat charging from direct current sources, as pointed out by Mr. Harris, and that from the tests referred to by Mr. Harris the efficiency of 44 cell batteries was shown to be in the neighborhood of 85 per cent.

Mr. Graves also wanted information as regards small voltage batteries or vehicles, and wished to know what proportion of the cars in an ordinary garage were included in this classification. Mr. Lincoln replied that 1912 cars, particularly the Baker and Anderson electric, have less than 30 cells, the Baker carrying 28 cells, but 40 and 44 in their trucks, the Anderson Company using 38 cells lead and 60 cells Edison.

Argo Half-Ton and One-Ton Electrics

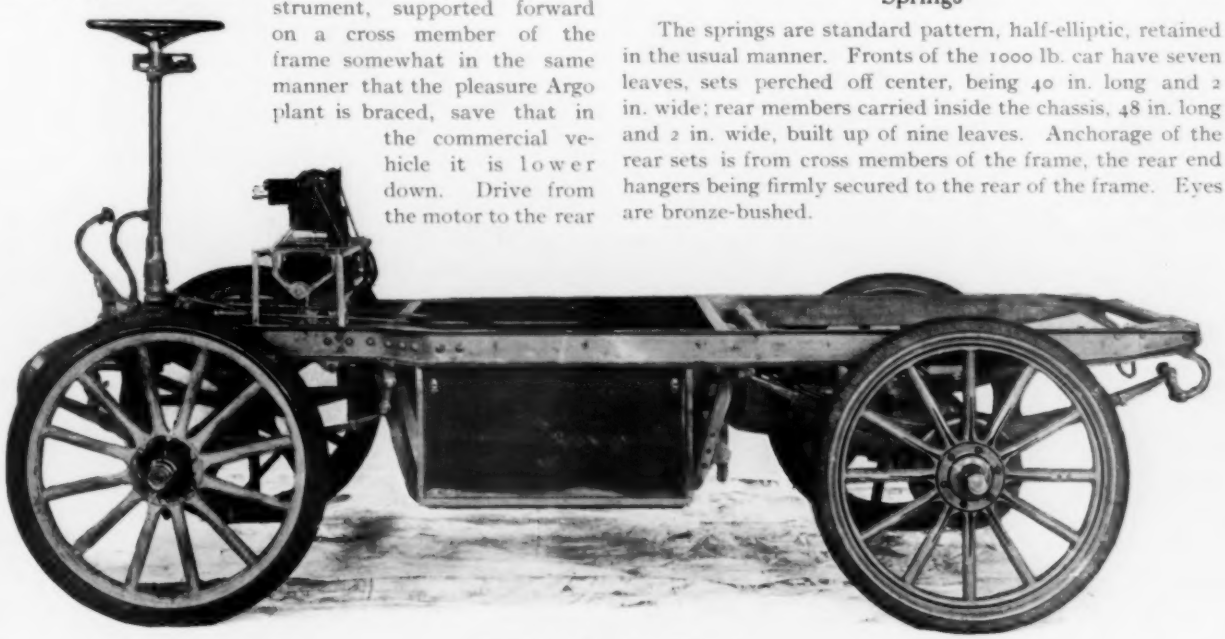
Unit Construction of Motor and Rear Axle; Underslung Battery; Left-Side Steering; Channel Section Frame and Four-Pole Westinghouse Motor

ARGO electric commercial cars are made in two sizes, one-half ton and one ton carrying capacity, by the Argo Electric Vehicle Company, Saginaw, Mich. The half-ton car weighs 2800 lbs. and sells for $1800; the one-ton vehicle weighs 3400 lbs. and sells for $2200.

Argo electric commercial cars have been tried out in various kinds of services and amply fulfill the expectations of the builders. A noticeable feature is the smooth and easy riding of the car.

Unit Construction

Unit construction is a feature of these Argo cars, the motor being a unit with the semifloating rear axle. The motor is a 48-volt series-wound four-pole Westinghouse instrument, supported forward on a cross member of the frame somewhat in the same manner that the pleasure Argo plant is braced, save that in the commercial vehicle it is lower down. Drive from the motor to the rear axle is through herringbone gears, which are quiet in operation, enclosed in a cast-steel housing, which is bolted at either end to the motor and the rear axle. All motor bearings are Hess-Bright annular ball.



Chassis of the Argo Electric

Showing the method of supporting the underslung battery, also the mounting of the motor as a unit with the rear axle assembly, and the controls at the front. The drive from the motor to the rear axle is through herring-bone gears enclosed in a cast-steel housing

The differential is of the four-bevel pinion type, and the mesh of the master bevel and pinion, which are of 1¼ in. face, may be adjusted. The rear axle housing is pressed steel of conventional design. The driving shafts are 1⅛ in. in diameter.

Underslung Batteries

Batteries are underslung and are easily reached from the sides of the car and withdrawn when necessary. The 1000 lb. car equipment is twenty-eight cells of 11 M. V. Exide, though Exide Iron-Clad or Edison batteries are to be had. The one-ton car equipment is twenty-eight cells of 13 M. V. Exide, or Exide Iron-Clad or Edison are to be had. The frame of the car is protected by means of wood fillers, due precaution being taken to properly ventilate the battery compartment.

Frame

The frame is 4 in. standard rolled channel-steel section, flanges 1⅛ in. The side rails are inswept forward and where the insweep occurs the member is solidly braced. Gusset plates are also used to strengthen the frame. Width at the rear is 42 in. inside, 32 in. forward. The cross braces are hot-riveted to place.

Springs

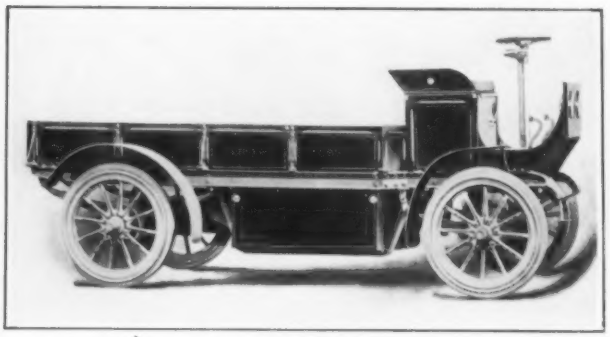
The springs are standard pattern, half-elliptic, retained in the usual manner. Fronts of the 1000 lb. car have seven leaves, sets perched off center, being 40 in. long and 2 in. wide; rear members carried inside the chassis, 48 in. long and 2 in. wide, built up of nine leaves. Anchorage of the rear sets is from cross members of the frame, the rear end hangers being firmly secured to the rear of the frame. Eyes are bronze-bushed.

Axles

The rear axle has already been described, the front being a tubular-steel affair fitted with drop-forged steering knuckles and firmly braced.

Steering

The car is steered from the left, through a gear reduction system, the three spur pinions supported in a cast-iron box secured to the frame, bronze bushings inserted in the pinions. The reduction is 2 to 1 and is easily cared for; there is ample provision for take up for wear. The statement is made that of various systems tried out the simple gear reduction affords about as good results for commercial use as are to be desired. The steering column is vertical and fitted



Argo Open Express

This electric has a mileage of about 50 per charge at 12 m.p.h; the dash is fitted with a Sangamo hour meter; loading space 90 in.; width 42 in.; wheel base 86 in. in the one thousand pound car, 100 in. in the one-ton model; height of platform 31 to 32 in.

with a large hand wheel. The rods are 1 in. in diameter, ball and socket joints and adjustable yokes being used, assembly carried back of the axle.

Wheels

Artillery wood wheels are used, 34 in., on both the 1000 lb. and one-ton car. Tires are 3 in. solid rubber, on the 1000 lb. vehicle; 3½ in. on the one-ton car. There are twelve 1⅜ in. spokes in the front and rear wheels of the 1000 lb. car. Cup and cone bearings are fitted forward, Hess-Bright annular ball at the rear.

Brakes

There are two sets of brakes operating in the rear wheel drums, 14 in. in diameter; internal expanding members being 1¾ in. face, external contracting 2 in. face. Final action is through steel cables carried in metal conduits, filled with grease; both brakes operated through foot pedals.

Control

Control is nothing out of the ordinary. The car is steered from the left, as noted above, through a pinion reduction system, left control being rather to be desired for city work, for which the electric is well adapted. The controller is a continuous torque type, no break in current in passing from one speed to another; operated through a horizontal hand lever working in a Z slot on the steering post. The wiring is carried in a well-insulated conduit along the side rail of the frame and supported in three brackets.

Gear reduction is approximately 12 to 1 in the 1000 lb. car and 15 to 1 in the one-ton vehicle. Mileage, when the vehicle is loaded, is approximately fifty, this based on loads in one direction; speed, 12 m.p.h. in the 1000 lb. car. The approximate radius of the one-ton car, loaded one way, is forty-five miles on a single charge; speed, 12 m.p.h.

The operator has knowledge of the battery through a Sangamo ampere-hour instrument conveniently placed, having trip and totalizing dials. Trip and total mileage odometer is fitted so that battery and tire records may be computed with accuracy.

Bodies

Either of the two chasses may be fitted with any of the standard bodies, but the express is the type featured. Loading space length is 90 in. and width 42 in., while the one-ton

Argo Panel-Body Delivery Car

In the Argo electrics the batteries are underslung as shown; the motor is a 48 volt series-wound four-pole Westinghouse, forming a unit construction with the rear axle; the steering wheel is at the left; the gear reduction is about 12 to 1 in the one thousand pound car.

car body is of the same width, but 100 in. long. Wheel base is 86 in. in the 1000 lb. car, 100 in. in the one-ton, tread being 54 in. in both models. Road clearance is 12 in. in both cars, while height of platform from the ground is 32 in. in the 1000 lb. and 31 in. in the one-ton car.

LARGE CLEVELAND DRY GOODS HOUSE BUYS ELECTRICS

The Halle Brothers Company, of Cleveland, Ohio, one of the largest dry goods houses in that city, has recently purchased a fleet of eight electric delivery wagons, made by the Baker Electric Vehicle Company, of the same city. The machines are finished in superb style. The bodies are of aluminum, fastened to a hardwood frame. Plate-glass side windows and divided windshields are used.

The Argo Electric Vehicle Company, of Saginaw, Mich., has just been awarded contract by the city of Alliance, O., for furnishing them with an electric ambulance-patrol of special body design, with carrying capacity of ten persons and driver. The city of Alliance has a reputation of being at the front in the adoption of municipal auto apparatus.

DOES NOT OVERLOAD

"No, I never worry about the driver overloading, he cannot do it anyway," says the owner of a 3000 lb. capacity electric truck. "With a gas car you can keep piling on the load, but with an electric it is a different proposition. When the load gets too heavy, why then you simply cannot haul it, that is all. The overload may be said to not exist in electric cars; exceed the capacity of the car and the speed drops and where are you? You must pull off the excess, that is all."

Read the Commercial Car Journal every month and learn what is happening in the industry. Learn how others do their hauling, better, quicker and cheaper by the commercial car. Its pages are full of live and interesting data pertaining to trucks and hauling.

OVERLOADING COSTLY

Many users of commercial cars make the grave mistake of overloading, and continue the practice when there are no visible signs of disaster, which, however, are bound to materialize sooner or later. In the majority of cases the owners state that the cars ought to be good for a little more, and, of course, there is that irresistible impulse to do all to-day that is possible, if to accomplish the purpose means overloading. But the practice is costly. Here is what one user has to say about the matter: "Overloading trucks is bad business, but it costs money to find it out if at the start you were not aware of the fact. I have learned by experience; that experience has come high, just as it always does. I have learned my lesson to the tune of a cold thousand dollars. I was the guilty party, I advised my drivers to put on a little more if it would save a trip at the end of the day. We were anxious to do as much as possible with each of the cars in the busy season, but that was a costly error. I think that it is much better to employ a five-ton truck and not overload it than to use a three-ton car and pile on the extra weight. Of course, any good car will stand it for a short while, but the thing will go back on you when you most need it; and you yourself are to blame. Commercial cars are indispensable in my business, and so, rather than to continue to overload at high cost, I have purchased a new five-ton car, and the driver that overloads had best look out for a new berth. Too much emphasis cannot be laid on the error of overloading."

COMMERCIAL CARS IN FLOUR-MILL SERVICE PROVE SATISFACTORY

TWO three-ton, four-cylinder, gasoline commercial cars are used by the Commercial Milling Company, Detroit, Mich., an average of ten hours a day at an estimated cost of nine to nine and a half dollars a day. Each one of these cars averages about fourteen tons a day. No absolute record as to detail is kept, but the cost of operation is, however, definitely known. The cost is estimated as follows:

Driver	$2.75
Gasoline	.75
Oil	.40
Depreciation	2.50
Tires	2.50
Repairs	1.00
Total	$9.90

This daily total of $9.90 is said to be a little more than the actual cost. The driver, it will be noted, is paid $2.75 a day and depreciation is charged up at $2.50 a day, it being the assumption that at the end of five years the cars will have to be replaced. The tire account is set down at $2.50 a day, and a dollar a day is allowed for expenses.

One Man On Truck

There is only one man on each of the Commercial Milling Company's trucks and he handles and discharges the load unassisted. It is stated that this has been found to be the better plan, for the reason that where a helper or extra man is carried along he simply occupies an easy seat for four or five hours a day, during which he is inactive. An actual saving is effected in this respect.

Rigid Weekly Inspection

There is a rigid weekly inspection of each of the two trucks, from five to six hours being spent in going over the machines thoroughly and observing the general condition, and if repairs are to be made, they are attended to. As the cars are busy throughout the week, starting out for the day at 6.30 and closing down at 5 p.m. or later, there is no time during the week to inspect them; and as the work is thoroughly done once a week, on Sunday, the vehicles are well looked after.

The drivers have been taken from the horse service and have been thoroughly instructed, and perform the necessary week-end inspections. They know when anything is wrong and report accordingly. The statement is made that very good results have been obtained from the drivers; in fact, the company pride themselves on the service and say that the drivers are excellent men.

Each truck will do the work of two teams at the same expense. This statement is well based, since the concern still uses twenty-six head of horses.

COMMERCIAL CAR HAULS SAND

The Clark Lumber Company, of Grinnell, Iowa, employs the Avery tractor shown herewith to haul sand, gravel and cement on country roads. The load hauled averages about four tons and the trip's length is six to eight miles, with one stop at each end. Four trips are made each day.

The type of tire used on this vehicle is of unusual interest. The tires are made of steel and are known as "country road" tires. It is safe to presume that punctures to this type of tire are unknown.

Three-Ton Avery Truck, With "Country Road" Wheels, Hauling Sand at Grinnell, Iowa

THE COMMERCIAL CAR ON THE FARM

In practically every field for which horse service is adaptable so is the commercial car, an instance of which is for farm work. The farming element, generally regarded as ultra conservative, are taking up with trucks for farm use and the representation is increasing daily. This being the case, one would rather have expected to see something a little out of the ordinary at the recent truck exhibitions at New York and Chicago, but there was but one maker who displayed a truck equipped for farm work. With this were shown a number of appliances to be used with the car. This vehicle, by the way, hails from the middle west and in a conversation with a member of the firm, a representative of the COMMERCIAL CAR JOURNAL was informed that a good share of the company's business came from the west "where farms are farms."

There is a big future for the commercial car for farm work. While it will be conceded that tillers of the soil are close with their money, they are nevertheless thinkers as evidence of which compare farming equipment of today with that of a decade ago. As an example of this: Last summer the writer was driven through a hilly section of Indiana, and his companion pointed to a farmer who was comfortably housed under a spreading canopy of a multiple corn hoe. "There's your farmer up-to-date," he replied. "We didn't do it that way when grandfather was a boy." Speaking of commercial cars for farm work, this man stated that he had been using them with good results on his own estate and found that a gasoline plow had every other method beat.

GROCER SAVES TWELVE HORSES BY USING THREE COMMERCIAL CARS

By using three one-ton commercial cars, G. & R. McMillan Company, grocers, Detroit, Mich., save twelve horses, and during the hot spell last summer the vehicles were found especially useful. "We are pretty well satisfied," was the statement here when the service was inquired into by a representative of the COMMERCIAL CAR JOURNAL.

The McMillan cars are kept in a local garage conducted solely in the interest of truck users, and if ever a car has to be laid up another is put in its place until the work is finished. The statement here is that there is no advantage in using trucks in city service proper, since the drivers have many stops to make within a short radius of the store. It is for the longer hauls that the McMillan cars are most useful, deliveries being made to Grosse Point and other outlying districts. Horse service, if one has much to do, is rather prohibitive because of time loss. Two of these cars which go to Grosse Point also made nearly the whole distance to Mt. Clemens. The heavy suburban trade is cared for by the commercial cars, and this has effected a betterment of the horse service, as there is not the strain on the animals. Two of the cars make an average of sixty to seventy miles a day. The third car does not make quite so much of a mileage, but is used to advantage in the outlying districts. A member of the firm stated that the cars were of noticeable advantage in hot weather. No elaborate record is kept of the vehicles, as they are cared for at a public garage where they are repaired and looked after.

MOTOR DELIVERY STATISTICS

A one month's comparison of a motor truck against horse-drawn vehicles, by a large concern, follows: Two teams: Tonnage, 250; mileage, 1,144; total expense, $229.16. Reliance five-ton truck: Tonnage, 780; mileage, 1,430; total expense, $152.10.

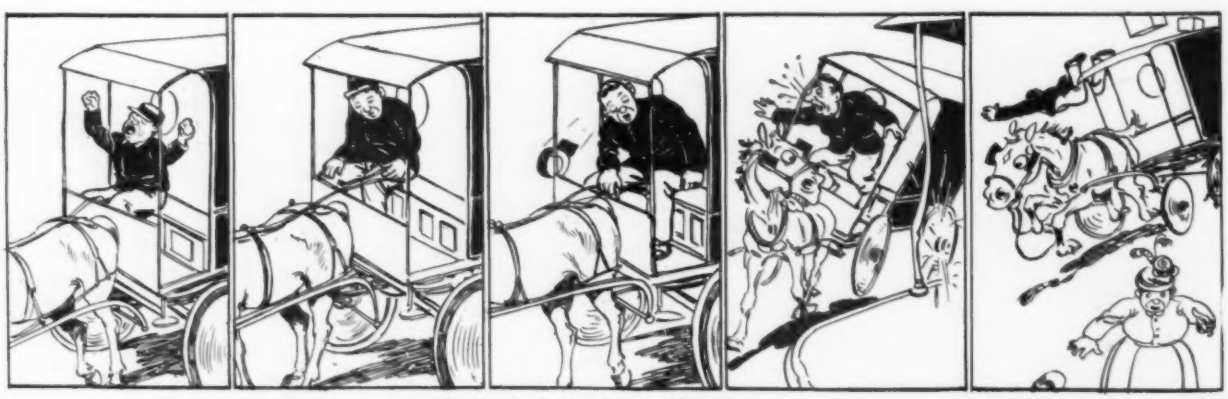
The item of expense in the above includes everything; salaries, gasoline, oil, feed for horses, etc. No repairs have been required on the truck during the three months it has been in operation. This shows that with teams it costs 20 cents per mile to haul 250 tons, while with the truck it costs 10.6 cents per mile to haul 780 tons. No depreciation is figured in the above for either equipment.

James Butler, Inc., a big New York wholesale grocery house, has ten five-ton trucks in daily operation. These were purchased as follows: One in January, 1910, three in February, 1910, one in May, 1911, one in June, 1911, four in September, 1911. In November, 1911, this grocer placed on sale his entire remaining stable of heavy draught horses, 100 of them, for the purpose of replacing all with G. M. C. trucks.

The two records above referred to are picked at random from many similar cases which could be cited.

MAINTAINING ORDER

One who has ever spent any time in the vicinity of freight stations during the busy hours will readily appreciate the necessity of maintaining order among the drivers who are wont to wrangle more or less. In Detroit the police department posts a mounted policeman at one of the freight stations, where quarters are narrow and crowded. This officer is on duty throughout the busy portion of the day and lines up the commercial cars and teams and the drivers unload and load in order. Sometimes this line of freight vehicles stretches a block or two from the station and there is no haggling, each comes in turn. The scheme is one worthy of serious attention.



One Result of Depending on "Horse Sense"

Does Motor Delivery Pay?

Observation of commercial car operation, of the attendant conditions, prove plainly that many business houses are only too willing to be relieved of the delivery problem when there is a reliable contractor to provide the peace of mind. It is one proposition to make the sale and quite another to make the delivery, for the purchaser may reside 15 miles from the store and yet by reason of the valuation of purchase be entitled to immediate delivery. Immediate delivery! that is the stickler with many a business institution. It is all very well to say, "We will send it out tomorrow or the day after." "No, that will not do at all, send it to-night," and it may be 5.30 then, a half hour of closing time, "or it's no sale." But, on the other hand, though this may be expecting a lot, the purchaser is within his rights when he specifies immediate delivery. And this is one of the many instances in which the contractor, the real "live one," fits in nicely. Now then, as to a contractor who has been in business a year and owing to commercial cars is doing nicely.

The Motor Service Corporation is a Chicago contracting house doing a delivery business for Chicago merchants. The concern started out in July, 1911, and Manager O'Donnell reports business as very good. He was asked how he happened to be in this particular line of business and his reply tells the story tersely, "It looked good to me."

An acquaintance of the writer not long ago stated that no man could make a paying business out of motor delivery.

Manager O'Donnell was asked, "Does motor delivery pay?" He smiled and replied, "It does."

Equipment

The Motor Service Corporation has in service twelve Mercury, 1000-lb. delivery cars, of which eight are active. That is, four cars are held in reserve, and, should one become disabled, there is very little delay, for another is sent out and the load transferred and delivered without loss of time. These twelve cars are insured against theft, collision, fire and the like and the drivers and jumpers are also bonded and insured at $500 each, so that the system is well protected.

Routes

The city is divided into three routes with two cars to each route. This utilizes six cars while the remaining two are kept busy collecting bundles which are brought to the central sorting station at 444 Plymouth Court. Here the bundles are checked and routed. The route sheet is reproduced herewith.

MOTOR SERVICE CORPORATION

828 EXCHANGE AVENUE

UNION STOCK YARDS

Phones, Yards { 188 / 191
Automatic 70-334

Chicago, ... 191

Motor Service Corporation,
Chicago.

Gentlemen.

Please enter our order for Stamp Books to the value of $———— entitling us to package delivery service, as follows:

For packages not exceeding five pounds in weight and not over one cubic foot in measurement, and not over $20.00 in value:

South Side:	Loop to 39th street	10c
	39th street to 75th street	15c
	75th street to 95th street	20c
North Side:	Loop to North avenue	10c
	North avenue to Fullerton	15c
	Fullerton to Irving Park boulevard	20c
West Side:	Loop to Western avenue	10c
	Western avenue to 40th	15c
	40th to Limits	20c

An additional charge of 5 cents will be made for C. O. D. packages.

These stamps to be redeemable at their face value at any time within thirty days from date of purchase.

This order is subject to acceptance by your main office.

Fig. 2. Order For Store Books Used In Contract Delivery

C. O. D's

One annoying feature of merchandise delivery is the collection on c. o. d. packages. As these are received, the manager of the delivery company pays the concern from whom the c. o. d. package has been received by check, so that the store does not have to wait for the collection. An additional charge is made for c. o. d. collections.

ROUTE SHEET

Auto No.____ Driver____ Helper____ Out____ A. M. P. M. In____ A. M. P. M. Date____ 191__

STAMP NUMBERS	FROM WHOM	ADDRESS	C. O. D		REMARKS
1					
2					
3					
13					
14					
15					

Fig. 1. Route Sheet Used By Motor Delivery Car Doing Business By Contract

Delivery Stamps

Patrons of this delivery corporation affix a stamp to each bundle not exceeding five pounds weight and one cubic foot measurement and not over $20 in value. The rates are shown on the accompanying form.

It will be noted from this sheet that the routes are laid out to cover the south, north and west sides. There is no east side in Chicago.

At the north the city limits mark the end of activities, 95th Street on the south. The average per car is 60 miles per day. All pickups are made in the forenoon and deliveries at the south are until 6 P. M. If a bundle is received before 6 o'clock in the evening it will be delivered that night if destined for the south section. The cars start out at 8.30 in the morning. Most of them finish up about 5.30 to 7 o'clock. Four-fifths of the firm's customers are within the "Loop," so called.

The maximum weight is about 20 lbs. per bundle and the cars will average 150 packages per day at about 15 cents each for the contractor. There are two men on each car, the driver and the jumper, the driver being paid $15 per week and the jumper $6. On Saturday, which is generally the heaviest day, all packages received are delivered on that day, not left over until Monday and what an important item that is to the purchaser at least, especially if that purchaser be a woman. On the pickup wagons there are three men, two jumpers and the driver. Extra cars are used on Saturday.

The company cares for the cars and has a night and day man on duty.

COMMERCIAL CARS IN SOAP MANUFACTURER'S SERVICE

While the conditions surrounding the service of the Larkin Company, of Buffalo, N. Y., one of the largest manufacturers of soap and kindred commodities in the United States, do not make for the very best results commercial cars are used to good advantage. This company uses a three-ton Peerless car, three Couple Gear electric trucks rated at five tons, and a three-ton Packard. Aside from these large vehicles there are also in service twelve Peerless pleasure chasses fitted with light delivery bodies. These are said by the owners to afford good service and meet the needs nicely since they are light and speedy and can be advantageously employed for the lighter work about the city of Buffalo. These light vehicles make about 35 to 50 miles a day and are cared for in the company's garage adjacent to the plant.

The four wheel drive electrics are said to be specially useful about freight centers where congestion is the rule, it being a simple matter to maneuver about since all four wheels are employed in steering.

The three-ton Peerless makes about 20 miles a day, the big electrics about 16 miles and the Packard about the same as the Peerless.

When it is realized that the longest hauls are but two miles it is obvious that the cars are not really employed to the best advantage notwithstanding which they are well worth while.

The owners state that to get the best results, to make the cars fully worth while they must be kept on the move and this policy is closely adhered to. A full load is carried.

the cars and the company has its own force and a good equip-

The Larkin garage is sufficiently commodious to care for ment to make repairs.

The accompanying illustration shows one of the three-ton Peerless cars with a full load. This company in connection with its business issues premiums which necessitates much freighting.

HE WAS A GOOD DRIVER

A representative of the COMMERCIAL CAR JOURNAL, while riding on the back platform of a trolley car in a middle western city, recently had occasion to observe the driving of a truck operator. To all appearances the man must have been about 55 years old, but it was a pleasure to watch him drive. To one who has the good of the commercial car at heart there is just as much inspiration in observing a real truck driver as the sportive enthusiast ever experienced in watching Lancia and other foreign redoubtables flirt with disaster. This man had occasion to slow up at cross walks, he kept behind the car all the way down, to his own side of the road. When he slowed down it was free and easy, no jar or jolt for the truck. When he picked up speed it was gradual and the motor did not get the chance to tear itself loose; when he went over car tracks he did it nicely, smoothly, evenly and the springs did not suffer. It was worth while to watch that man work. His speed was steady and consistent, and how nicely he did get over the ground.

HAULS 878,968 POUNDS OF COAL IN A MONTH

Hauling 878,968 lbs. of coal in a month of 24 working days is the record of a motor truck owned by the New England Coal & Coke Company, of Boston. This company operates three Alcos in its service.

The daily average maintained by the truck was 36,624 lbs. The largest number of pounds hauled in a single day was 44,300. The most miles covered in a day was 63, and the record number of trips was seven.

Out of 229 hours on duty during the month the truck was kept running 126 hours, the rest of the time being occupied in loading, unloading, etc. In the aggregate 119 trips were made, averaging 8½ miles each—or all told, mileage of 1,005 miles for the month.

Every business man who requires one or more teams to do his trucking or delivery work will find it greatly to his advantage to become a regular reader of the COMMERCIAL CAR JOURNAL. He will find it full of information which will be of great advantage to him, as it will show him the results which he can secure by substituting commercial cars for his horse drawn vehicles, help him to select the proper cars for his own use, and also enable him to get the best results out of them when he does buy them.

Failure! **The best commercial car made and a bad driver**

COMMERCIAL CARS VALUABLE IN ICE SERVICE

"We are satisfied" was the response given our representative when he recently called on the Peoples Ice Company at Syracuse, N. Y., and asked how things were going. This concern, which is one of the largest in that city, has been using two Chase air-cooled, three-cylinder, two-cycle cars.

"How much work do these cars accomplish?"

"One truck will do the work of two teams, that is, four horses and two wagons. The cost is about the same. It is an even break."

"Do you overload?" was asked.

"No, each load of ice is weighed on the scales before the car leaves the yards. If there is too much the excess is removed."

"Who have you for drivers?"

"One man was supplied by the factory and the other we had broken in at the factory."

"Are they good men and do they understand the cars?"

"Yes, they get along all right."

"For just what service do you employ these two cars?"

"Mostly for long hauls. The best thing about these commercial cars is that they are especially valuable in hot weather. On July 4th last we had seven horses drop from the heat. Two of them died but the truck kept right on. Another good thing about them is that if by chance in very hot weather a customer has been skipped, we can soon get a supply to him. We find the cars very useful for long hauls. When the horse teams are busy the cars take out the loads to the different routes, which saves the teams coming back to the supply houses and thereby a lot of time is saved."

"What does your service cost?"

"Thirty-seven dollars and fifty cents a month aside from tires, oil and gasoline. We have an arrangement with the service department of the factory. The trucks are turned over to them every night. If repairs are needed they are made and the cars are ready in the morning. If a driver has trouble on the road he never bothers us. He calls the factory and they provide another car if necessary. The trucks are guaranteed for four years and we find the arrangement quite satisfactory."

"How many horses have you and how does a horse stand your service?"

"We use one hundred horses and a horse in our service will last from one to ten years."

"If a horse goes down in a year, to what do you attribute the cause?"

"The driver is responsible. Whenever you hear of a horse going down quick you may be sure, as a rule, that the driver is at fault."

"What is the average day's work?"

"Six trips a day, averaging about 30 miles."

When asked if more cars would be installed, the opinion expressed was that it was likely. Thus far the cars which have been used more than a year have done very good work.

The ice supply is gotten from two lakes one of which is 21 miles distant, and in addition there is a large artificial ice plant. From the point most remote the ice is shipped by rail, from the nearest by boat, and should either of these two fail in transit the artificial plant can meet the demand, for there is always plenty, which is a most fortunate state of affairs. According to the company, Syracuse does not want for ice, which cannot be said by other cities in the middle west, Detroit for example, where during a hot spell in July, some customers were without the commodity for four days.

SERVICE EMINENTLY SATISFACTORY

WHAT A HARDWARE DEALER HAS TO SAY

Commercial car service has proven eminently satisfactory for the T. B. Rayl Company, Detroit, Mich., a factor in the hardware trade in that city. A few days ago our representative asked H. B. Coleman, general manager of the company, just what sort of service was derived from a 1½ ton Rapid two-cylinder truck. "The car has proven so eminently satisfacory in every detail that we have ordered a two-ton car, as the present machine is not equal to the demands made upon it. Our service has outgrown the car." The statement is self-explanatory.

So well pleased were the owners with an old type of gasoline truck that the car shown above, of increased carrying capacity, was put in service. This new car has been in use throughout the winter and is doing good work. Where the picture is taken the street is partially flooded.

Mr. Coleman, by the way, is an out-and-out commercial car enthusiast; he is firmly convinced of the efficacy of the up-to-date method of doing business. When asked just what he thought of commercial cars, he remarked, "The merchant who neglects to take up the commercial car proposition is not on to his job." It would do some of the skeptics good to talk with Mr. Coleman—he knows his service, the conditions that surround it, knows the ins and outs, which is the fundamental basis of satisfactory service.

The car, he states, averages about fifty-five miles a day; rather a conservative statement. Two trips are made to the city limits. Now, that does not sound as if it meant much, but from the center to the limits in Detroit implies a lot, especially if one uses horses. Just pay the tax on a little cartage and you readily realize it. The car covers the city five to six blocks east and west of Woodward avenue.

From seventy-five to one hundred and twenty-five deliveries are made each day and the car is always loaded to the limit—sometimes a little more, for that matter.

The car has been in service twenty-five months and the daily consumption of gasoline is about seven gallons; oil, one quart. In connection with the oil a saving of sixty per cent has been effected. This has come about by using graphite with the oil. Very good results are claimed, and as the car is used 306 days a year at the least, and the daily consumption of oil is reduced, it is obvious that much is saved in this one item alone.

"How about your drivers?" was asked. "We have had our troubles," was the reply. "The man at present on the car knows his business and gets along very nicely. He has enough interest in the car and his employers to do things as they should be done; and, of course, in the long run, he betters conditions for himself as well as his employers.

Mr. Coleman was asked what repairs had cost since the car has been in service, and he stated that $275 would cover the item, of which sixty-one dollars was paid by a joy-riding driver who did a few stunts with the car that are not called for by the Rayl program of service.

As for tires, excellent service has been obtained and two of the original Firestones are still doing duty after twenty-five months of hard service. Tire cost for twenty-five months was $121.

Some idea of the value of the car is evident from the fact that it does the work of three double horse teams. The ability to get there and back with a load in short order, is the answer. Now that the two-ton car is about to go into service, it follows that considerably more can be accomplished.

The Rayl service is a good example of what can be done when all features are squarely met; when things are done consistently.

CUSTOMERS ENTITLED TO QUICK DELIVERY

"One of the many reasons why I am using commercial cars for delivery," says the traffic manager of a large eastern dry goods house, "is that our customers are entitled to prompt delivery. There are two sides to every question and there are two sides to a purchase and a transaction. There is our side, the sale and the delivery, the customer's, the purchase. It is within the bounds of reason for the customer to expect a prompt delivery. To deliver a bundle two days after purchase is wrong, I don't care whether it is this establishment that is at fault or some other. With horse equipment, you cannot get the results, and it must be remembered that deliveries well outside the city are heavy. We make a bid for suburban trade and offer as an inducement prompt delivery. The suburban customer, as a rule, is a good spender and when he or she comes to town it is a case of a whole day spent in shopping. Now then, if the purchaser lives five or ten miles outside the city and has made a good purchase, is it not reasonable that quick delivery be made? Most assuredly it is. In a store like this the country trader, probably, in the course of the day, visits about every department. The bundles make quite a pile. It is to our advantage to get them out of the way, for crowding in the shipping room means delay. We can do so much more with cars, especially for the long distance work, that horses are out of the question, and we can deliver direct to better advantage we think than to let another do it for us.

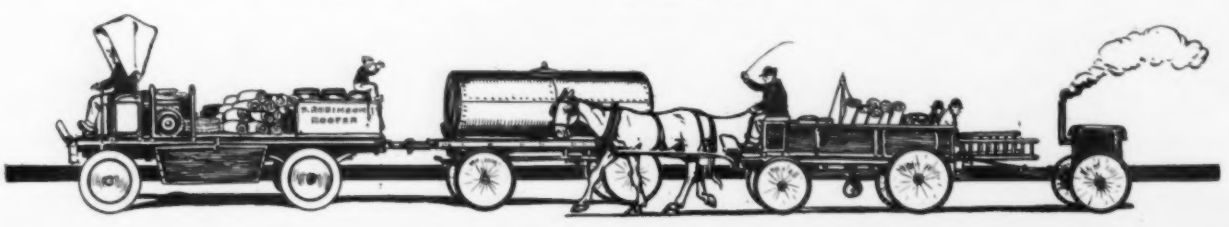
We have made some mistakes in the cars we have used. These mistakes were costly but after all we are better for it. We now know what we can use to the best advantage for suburban hauls. We must have a car that goes all the time, not now and then."

WOULD KILL A HORSE

"Look at the clock," said a good-natured, hustling German, "there is a good example of motor delivery. I wouldn't be through with a horse for an hour and a half yet and the way things have been going for the past three weeks it would kill the poor animal." The exponent of modern methods is engaged in the candy business and covers about eighteen miles on one trip about the city of Cleveland, Ohio; lately he has been making two trips, which he could not do with a horse. He purchased the car a short while ago, and had had no previous experience, and he has gotten along very nicely. As he expresses it himself, "I give her the juice and away she goes." This service is typical of many in any large city where it requires actual service to fully demonstrate the efficacy of commercial car equipment.

SPEEDING THE MOTOR

Many drivers of commercial cars are prone to that same disastrous habit possessed by professional pleasure car chauffeurs, of speeding up the motor when light to see how fast it will run. A representative of the COMMERCIAL CAR JOURNAL was in a garage recently where the motors of two or three cars were being speeded up by the drivers. For a time the combined volley was worse than that of a battery of machine guns, and so much oil and such a poor mixture was being used, thick clouds of choking smoke were emitted into the close, poorly ventilated quarters. The motors were throttled down and then suddenly let out to the utmost. Speeding the motor up to the limit when idle is a practice too common for the general good of the owner, and it should be stopped. The driver who thus toys with the engine, plays into the repairman's hands.



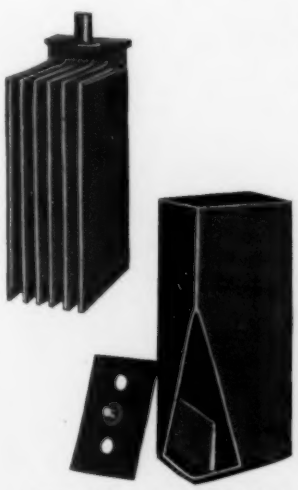
TRUCK ACCESSORIES AND APPLIANCES

The "Salom" Storage Battery. Complete Cell-Assembled with Pillar Straps and Side-to-Side and End-to-End Connectors. This cell is made in various types to suit special conditions. The size of the plate is 5¾ by 8⅝ ins.

THE "SALOM" STORAGE BATTERY

Uniformity of construction is one of the chief features claimed for the "Salom" battery, which is made by the Niagara Lead & Battery Company, of Niagara Falls, N. Y. The plates are made up of initially formed active material, or spongy lead. This material is applied to the conducting grids under great mechanical pressure, insuring uniformity of construction. The manner in which the active material is incorporated with the plates, it is claimed, will absolutely prevent shedding. The plates are all mounted in high ribbed jars, thus eliminating washing between renewals and thereby reducing the cost of maintenance to a minimum.

"Salom" cells are made in a number of types to suit varying conditions, and with any number of plates per cell, from seven up to thirty-five. The size of the plate is 5¾ by 8⅝ in. Type V is designed for heavy work, while the type E. T. V. is suitable for machines where great mileage is required.



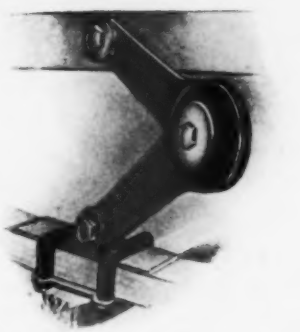
Group of Plates, Assembled with Pillar Straps and High Ribbed Rubber Jar Cover and Vent, "Salom" Storage Battery—Niagara Lead and Battery Company, Niagara Falls, N. Y. The plates are all mounted in high ribbed jars to eliminate washing between renewals.

THE MONDEX SHOCK PREVENTER

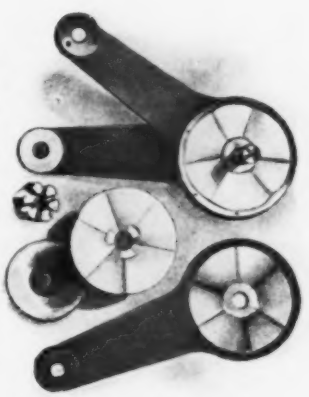
This device, which has primarily been put on the market for use on pleasure vehicles is now being made by the Aristos Company, of 250 West Fifty-fourth Street, New York City, especially for use on commercial cars. The planes in the latter type are made steeper and all throughout the device is made much heavier.

A series of inclined planes of high carbon steel against smooth rolled high grade brass riding up on each other on the wedge principle, expanding and contracting discs of firm but resilient rubber. The rubber cushion rapidly increases in resistance the further it is compressed, so that a heavy shock meets with much resistance, and a light shock with little resistance.

The difference between the downward motion and the upward or recoil of the spring is met by having a greater amount of rubber compression on the upward movement than on the downward. This is done by the different grades of incline of the planes, laid out scientifically. Price of the Mondex, set of four, including brackets, is $50.



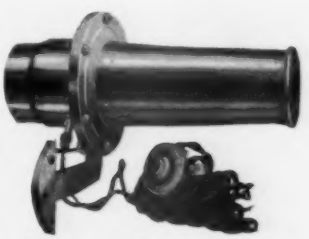
The Mondex Shock Preventer; showing the same in position in between the axle and frame of the car—Aristos Company, 250 West 54th Street, New York.



Parts of the Mondex Shock Preventer; showing the inclined planes which do the work—Aristos Company, 250 West 54th Street, New York.

THE NEWTONE TORPEDO ELECTRIC HORN

The horn illustrated herewith is made by the Automobile Supply Manufacturing Company, 220-40 Taaffe Place, Brooklyn, N. Y. It is of the electrically operated type and gives a warning note as powerful as the roar of a cannon. The fields are made up of seventy-five very thin discs of special steel thoroughly insulated. The sound diaphragm is rust-proof and the horn requires no oiling nor sound adjustments and it can be attached to either side of the car. The price of this horn is $20. It is guaranteed for one year.



The Newtone Torpedo Type Electric Horn, Price $20—The Automobile Supply Manufacturing Company, 220-240 Taaffe Place, Brooklyn, New York.

BROWNELL COMMERCIAL CAR SPECIALTIES

Transmissions, engines and complete power plants are featured by the F. A. Brownell Motor Company, Rochester, N. Y., for commercial car use. We illustrate herewith, a four-cylinder, vertical, water-cooled valve in the head engine with multiple disc clutch and sliding gear transmission, these forming a unit and ready to be attached to the car. The Brownell Company has long featured this equipment, which had been widely used throughout the United States. The four-cylinder motors, which are assembled as units with the three speed sliding gear, selective transmissions, are to be had in the following sizes: 3½-in. and 3⅝-in. bore and 4-in. stroke, or 4-in. bore and 5-in. stroke.

Six-cylinder types are also featured with the unit plant, the cylinders being the same size as in the four models. The construction in all sizes is about the same.

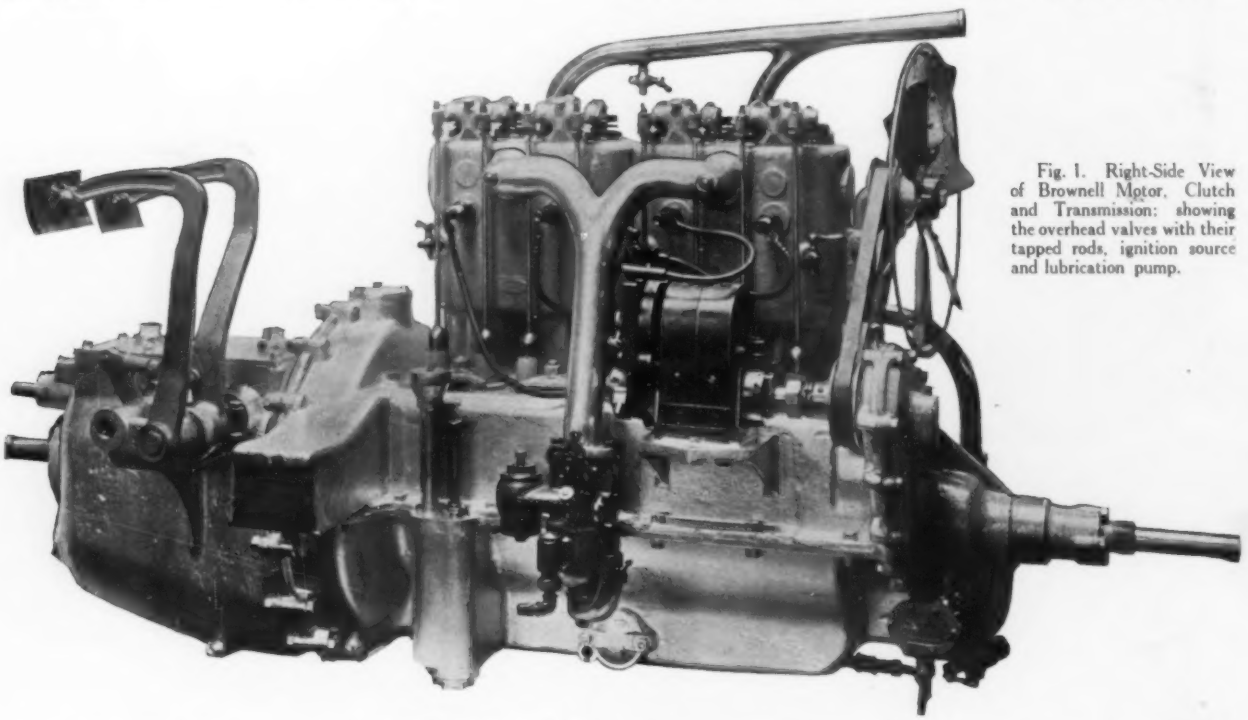


Fig. 1. Right-Side View of Brownell Motor, Clutch and Transmission: showing the overhead valves with their tapped rods, ignition source and lubrication pump.

In all models the cylinders are cast in pairs with integral water jackets, the valves disposed in the heads, these of large diameter, worked through steel vertical push rods. The pistons, like cylinders, are made of the best quality of gray iron and four oil grooves are turned below the wrist pin, this made of special cold drawn steel, hardened and ground to within a thousandth of an inch and held in the piston with a set screw having a taper point. There are three 45-deg. joint rings carried above the piston pins and are pinned to place.

The crank case is made of aluminum, the supporting lugs formed with the top half of the case. It will be noted that the fly wheel and clutch are fully enclosed, which is quite desirable for truck use. To insure the greatest strength the case is heavily webbed. The entire plant may be supported at three points, the two lugs on the clutch housing forward in a journal on the front of the case.

Lubrication is by force feed and splash, the under part of the crank case containing the oil supply. The oil passes through a screen at the lowest point so that it is properly filtered before it is led to the main delivery pipe, cast in the upper case on the exhaust side. The oil is led from the main line direct to the main bearings and then is forced through the drilled crank shaft to the crank pins. The connecting rods set up the necessary splash.

The clutch of this unit plant consists of twenty-eight plates of saw steel running in oil. Half of the discs are driven by six hardened studs in the fly wheel, the other half held with six hardened steel screws in the clutch driver.

The transmission is fitted with imported ball bearings and the main and counter shafts are made of 3½ per cent. nickel steel. Brown & Sharpe gears are used in the assembly.

The Model 750 Brownell transmission shown herewith is especially designed for heavy truck service. The system is selective, three speeds forward and reverse, capacity up to five tons with weight of 385 lbs. The ratio on the first gear is 1 to 1, second or intermediate 1 to 2, third or low 1 to 3 and on the reverse 1 to 4. This ratio is again reduced in the bevel differential 3 to 1.

The gears are of Brown & Sharpe production, special open hearth steel forgings, 5-in. pitch, 1½-in. face. The main drive pinion has twenty teeth and is supported on two Timken roller bearings, 2½-in. diameter.

Differential gears are 6-in. pitch, involute form, 18 and 33 teeth, 1¼-in. face, two bevel gears and four pinions used. The gears are mounted on jack shafts 1⅝-in. diameter, squared at the inner ends, the pinions on four arm spider; 1-in. arms.

Bearings throughout this assembly are Timken roller of ample size. The gear case is a malleable casting and the gear shafts are nickel steel. The sliding gears are operated on a square shaft. The shifter rods are ¾ x 1¼ in.

The Model 755 transmission is about the same save that the reduction is 4 to 1. For lighter service the Model 730 is offered, gears in this being 6-in. pitch and 1-in. face. This

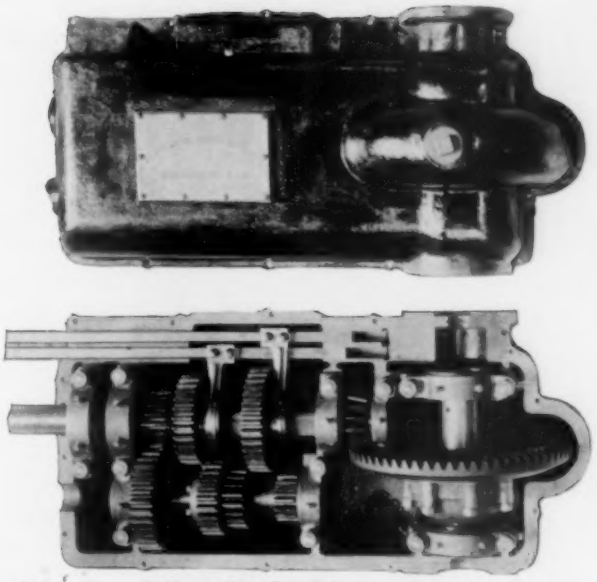


Fig. 2. Brownell Change-Gear Set With Cover Removed to Show the Gears, Shaft Bearings and Bevel Gear to Jack Shaft

smaller transmission is to be had in ratios of 2 1-7 to 1 and 3 to 1. Capacity is up to two tons.

These same types are also furnished without differential suitable for direct drive where the differential is installed in the rear axle.

Brownell transmissions are guaranteed for one year against defective workmanship and material and prices are to be had on application.

MODEL B, BRENNAN TRUCK MOTOR

The Brennan Motor Company, Syracuse, N. Y., features for commercial car use, a four-cylinder, vertical, water-cooled engine, 4½ x 5 in., cylinders cast in pairs with integral water jackets, rated at 35 h. p. and weighing 400 pounds.

It is of the L type with the valves located on the left side, the stems and tappets enclosed in individual bronze cases. The valves, which have grey iron heads and ⅜-in. carbon steel stems, are 2 in. in diameter and are worked through push rods fitted with roller lifters, ¾ x ⅜-in. rolls. The upper ends of the valve stems bear in cast iron guides which are forced into the cylinders. The cam shaft is solid, 1-in. diameter, and the timing gears are spur type, keyed to the shaft by two keys disposed 180 deg. apart. There is the usual device for adjusting the valve action. There are three 2½-in. plain bearings for the cam shaft.

The crank shaft is a special forging having three plain bearings. The end bearings are 1¾ x 4¼ in., the center 1¾ x 2¾ in. while the crank pins are 1¾ x 2⅝ in. The connecting rods follow the usual I-beam section construction and the crank pin bearings are held with four 7-16 in. steel studs and lock nuts. The fly wheel is 16½ x 4 in. and is bolted to the integral web of the crank shaft.

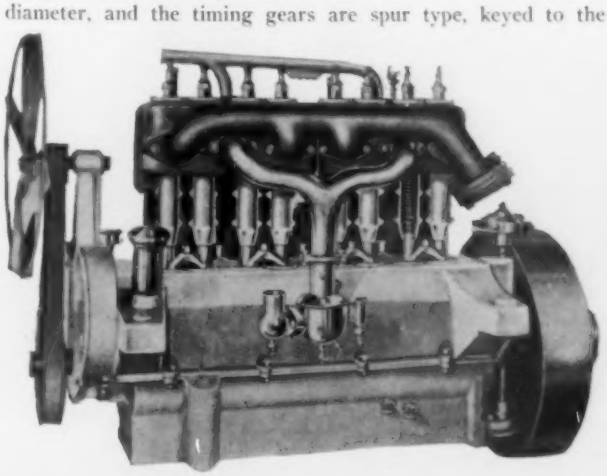
The Model B Brennan engine is to be had with or without cone clutch and when so fitted it is 15 x 3 in., face 12 deg. The facing may be leather, cork, Raybestos or whatever the purchaser may specify.

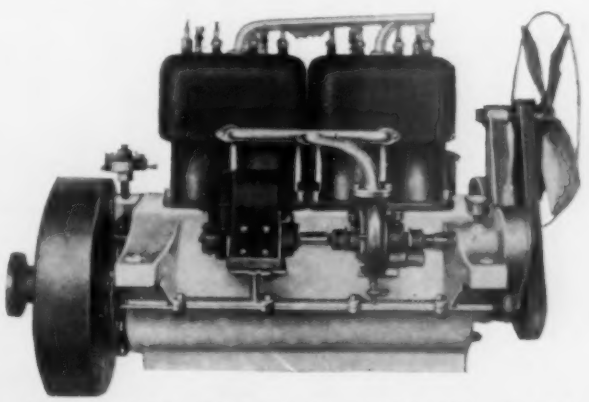
The crank case is formed in two sections, parted on the center line of the bearings, which are supported in the upper section, this webbed for strength. The engine support is at four points by means of the integral arms of the upper section. The lower half of the case is used as a splash pan and oil reservoir, there being a false bottom. The oil is lifted by a gear pump. The force feed system is entirely self-contained and a sight gage denotes the level. Oil is pumped to all bearings and the overflow provides the essential splash. Oil is renewed through a large baffle plated breather located in the left forward supporting lug. The main oil line is a large brass pipe carried in the upper section of the case and from there it passes through individual smaller pipes to the bearings.

Water is circulated through the cylinder jackets by means of a centrifugal pump on the right side, this driven off the motor gears, intake from pump at the base of the jackets, outlet through the heads.

The Brennan Model B Engine is designed for single, double or dual ignition. The timer is driven from the rear end of the cam shaft and the magneto supported on a bracket integral with the crank case, is driven from the water pump shaft through the usual flexible coupling and short shaft.

The drop from the supporting arms to the center of the crankshaft can be varied from 2½ to 3 in. The length from the front of the fan to the rear of the cylinders is 28 in., length over cylinders 22½ in. This motor can also be furnished with a unit power plant.





Right and Left Sides of the Brennan Commercial Car Motor; showing how the valve stems, springs and brackets are enclosed in two-piece bronze housings. Cylinders are cast in pairs with integral water jackets and the valves have grey-iron heads and carbon-steel stems. The crank case is formed in two sections with the motor bearings supported in the upper half. Lubrication is by force feed and splash.

The Latest Gasoline-Electric System

BY OUR FOREIGN CORRESPONDENT

TWO notable examples of gasoline-electric cars for commercial work have made their appearance in London within the past few months. One of these is of peculiar interest, because it is the outcome of experience gained from the patent which, I believe, more than anything else, was instrumental in upsetting the projected Premier Motor 'Bus Company that, with a capital of five million dollars, was going to enter into competition with the London General Omnibus Company, for the passenger traffic in London.

The present system is the Tillings-Stevens, brought out by Mr. Percy Frost Smith (engineer of Tillings, Ltd., one of the large London motor omnibus firms) in collaboration with Mr. Stevens (inventor of the Stevens gasoline-electric system). The older gasoline-electric machines, used by Tillings and built under the S. B. S. patents, had their two rear road wheels rotating on a solid axle, and each was driven separately by a worm shaft by separate electric motors; the two motors, one on each side, being so connected as to give an electrical balance action, and thus dispense with any necessity for a mechanical differential. These two separate motors were supplied from a dynamo driven by the engine at the front. It was in this drive, I believe, that the S. B. S. system is thought to have anticipated that exploited by the Premier 'Bus Company.

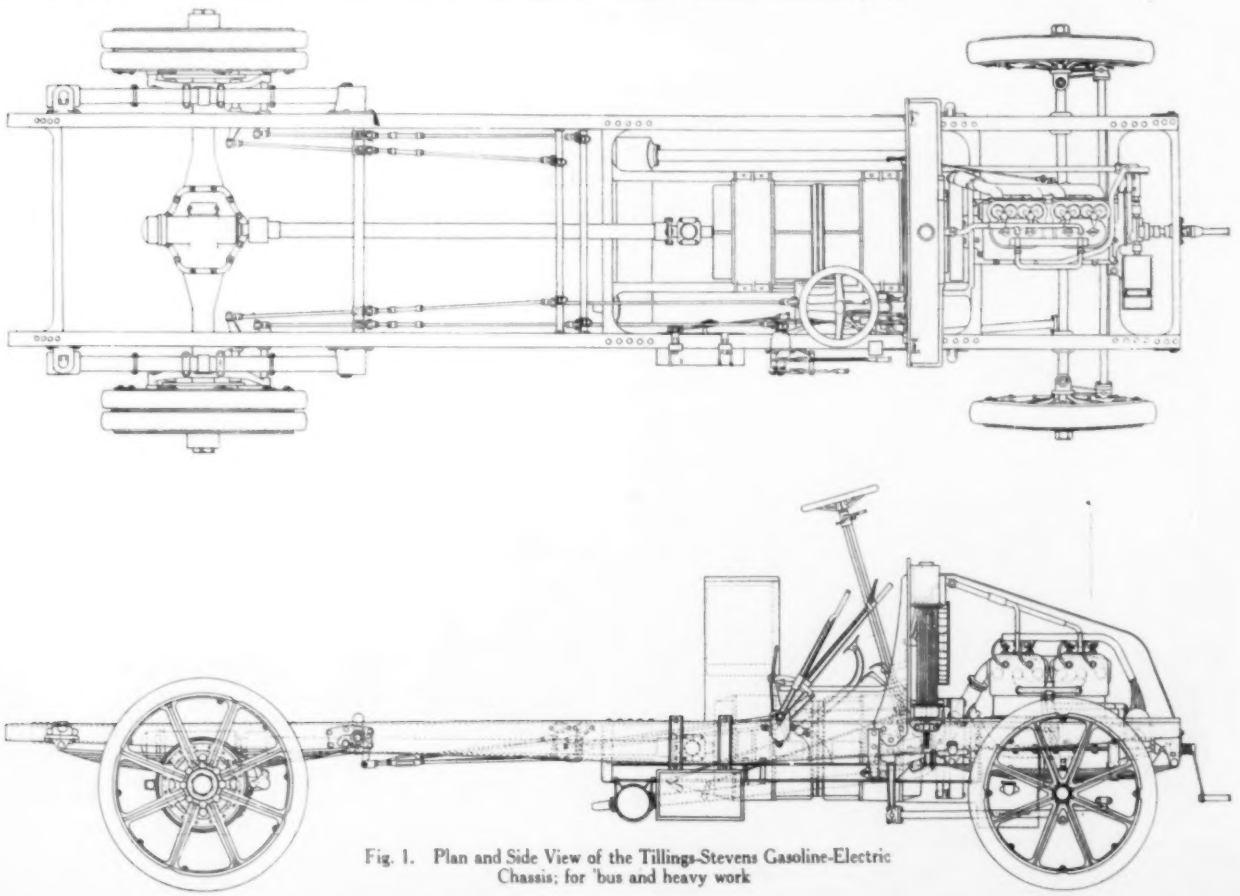


Fig. 1. Plan and Side View of the Tillings-Stevens Gasoline-Electric Chassis; for 'bus and heavy work

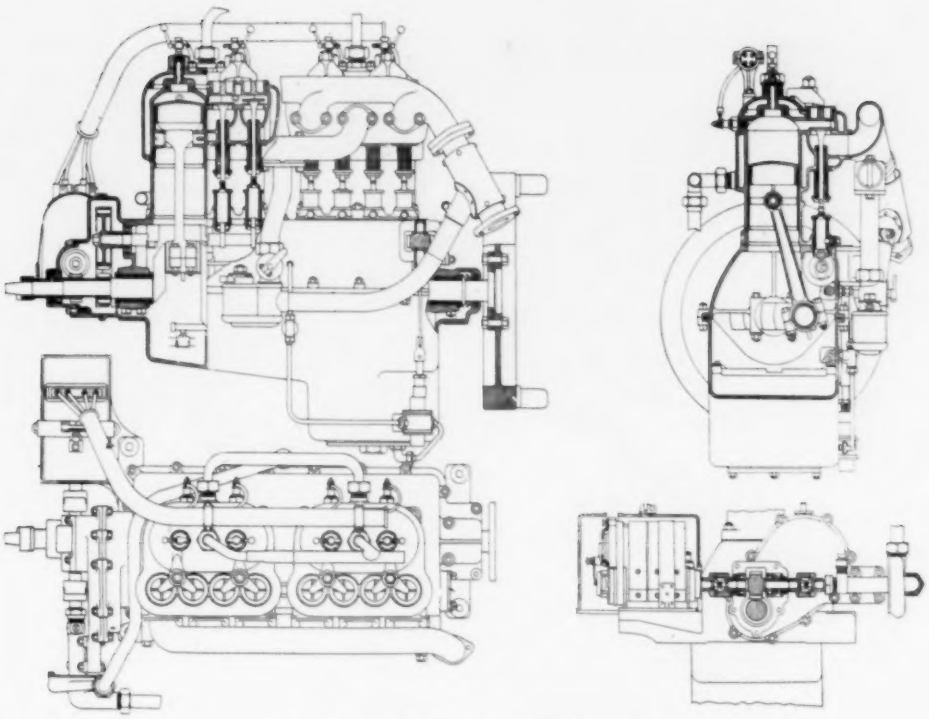


Fig. 2. Plan, Side and Elevations of Engine

In the new design, however, the police requirements of 3½ ton unladen weight limit for omnibuses have necessitated the doing away with this double drive, and therefore in the latest type a rear live axle is driven in the ordinary way by a worm propeller shaft.

General Principles

The system may briefly be explained thus. The engine drives a dynamo, which is in turn connected with an electric motor that transmits the power through the propeller shaft to the back axle. No buffer battery is used, and the engine is started with a crank in the usual manner. The dynamo is a 25 kilowatt shunt-wound machine, running up to 1400 r.p.m. It is so designed that a shunt resistance, operated by hand, governs the generator field, so that the magnetism may be weakened to allow of a species of slip, by which, when speeding up, the gasoline engine can regain its normal number of revolutions. The whole system depends on a generator so designed that as the load, and consequently the demand on the generator, increases, the current increases, with a corresponding reduction in voltage; and thus we obtain an electric action similar in result to that given mechanically by change-speed gears; in other words, we have an electrical means of converting speed into power in ratios variable at will. The shunt resistance, however, is only used on gradients; ordinarily the speed is governed by a pedal controlling the engine throttle.

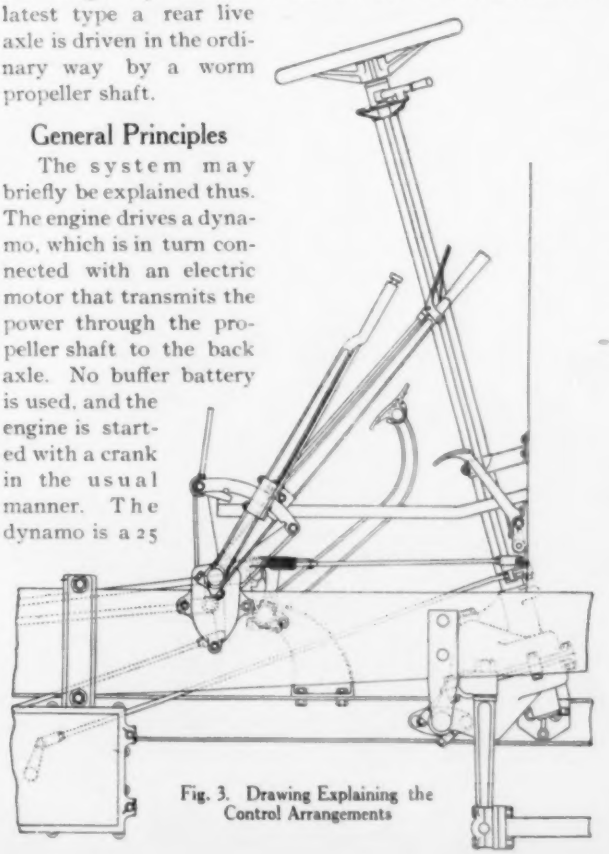


Fig. 3. Drawing Explaining the Control Arrangements

The Engine

The engine, on the whole, follows standard practice. Its four cylinders of 105 mm. (4¼ in.) bore and 125 mm. (4 15-16 in.) stroke are cast in pairs, and give off about 40 h.p. The size of the valves, 50 mm. (1⅞ in.) diameter, is worth noting, as also is the way in which each cylinder is closed at the top by a screw-down plug, designed to form both a water jacket cap stud and a pipe into which the compression tap may be fitted, while the whole arrangement is locked by a nut on the outside. The cam shaft is driven by an inverted-tooth chain in front of the pinion chain sprocket. For this purpose a skew-gear-driven crank shaft may be seen for driving the water pump and magneto, both of which are coupled up to each through dog clutches. A glance at the photo will show that a Renault style bonnet and radiators have been employed; but unlike the Renault designs that depend on the thermo-syphon principle for cooling, the 'bus has pump-forced circulation; as experience has shown that the thermo-syphon system is not yet sufficiently developed to be able to meet the very

heavy demands put upon the cooling apparatus by the conditions of London traffic.

In other points the engine design calls for no particular remark, and its general features are sufficiently indicated in the accompanying drawing.

The Electrical Equipment

There is a peculiar form of coupling between the engine and dynamo. In the drawing, Fig. 4, two laminated springs, bolted to a bracket on the dynamo shaft, may be seen. These springs are slid into place with each end between a couple of pegs bolted to the flywheel rim. This flexible coupling, which is carefully balanced, takes up any stress due to cross-winding of the frame over rough roads; and also obviates undue jar to the dynamo armature, which runs on ball bearings housed in the aluminum generator casing, and is also provided with easily removable aluminum covers over the commutator brushes.

This dynamo, constructed by W. A. Stevens & Company, is controlled through a resistance box secured to the frame side behind the levers, and by means of this resistance the field strength can be altered, so that an increased armature speed can be allowed through a weakened field on bad gradients, as already explained. The box offers three lever positions: forward, neutral and reverse.

As the magnets do not excite below 300 r.p.m., there is no need to disconnect the engine from the dynamo; it is only necessary to throttle the engine down below the specified speed.

The field windings of the machines are so devised that even if the dynamo and motor are connected when the former is being run at high speed, the motor does not excite quickly enough to cause a sudden start.

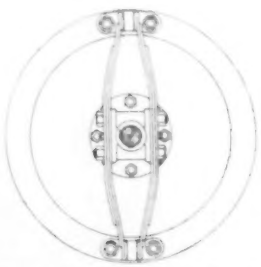


Fig. 4. Showing the Spring Coupling Between the Engine and Dynamo

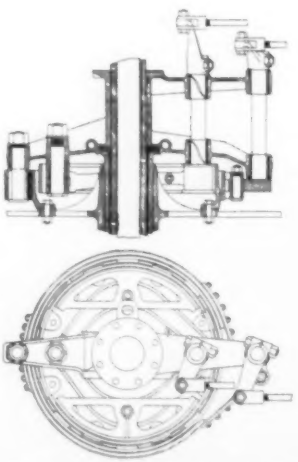
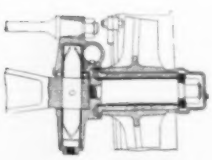


Fig. 5. The Brake Arrangements, Seen in Side View and in Section



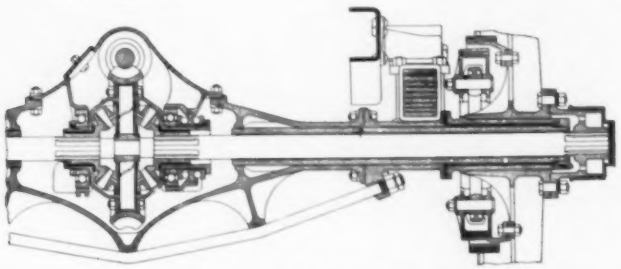


Fig. 6. The Live Back Axle With Top Worm Drive. This shows a rather unusual type of truss construction

Fig. 7. View of the Tillings-Stevens 'Bus

The motor, like the dynamo, runs on ball bearings, and the ball-bearing joint connecting its tail end with the propeller shaft is worth attention for it ought to be particularly easy of renewal.

Insulation throughout the electric system has been tested at 1000 volts continuous, and for the motor 90 per cent efficiency is claimed, while the dynamo reaches 88 per cent efficiency.

From the ball-bearing joint already mentioned the propeller shaft is carried to the rear live axle, where there is a splined joint to allow for spring play. This axle, which is worm-driven on top, has one or two points of particular interest. In the first place, the entire worm gear can be removed through the cover at the top of the cast-steel casing, after the driving shafts have been withdrawn a little; for the shafts drive the wheels through a disc connection at their ends, and this disc connection can easily be uncoupled. By this arrangement also the axle driving shafts are relieved of all bending stress and only have to transmit torque. Secondly, the differential spider is carried in recesses bored at the ends of the axle driving shafts. Thirdly, the wheel bearings are lubricated from the worm gear box (which accordingly has to be kept fairly full), and careful provision has been made for retaining the oil by means of the felt rings, shown in the sectional drawing of the axle.

In other respects, though evidently very carefully designed, this machine calls for no explanations that cannot be afforded by the accompanying drawing.

The machine, which is certainly very quiet and smooth-running on the road, seems fairly fool-proof. When in action the driver only has to keep his engine running at a constant speed, except down hill, and the control is so arranged that a jerky start seems to be impossible.

LONDON 'BUS COMPANY DECLARES DIVIDENDS

The directors of the London General Omnibus Company, of London, have declared a dividend of 8 per cent on their ordinary stock, and after writing off depreciation and the loss on transition from horse to motor traction (the last London General horse 'bus ran its last journey last month), the company has carried forward $505,000.

Auto Fire Brigade Practice In Europe

The Motor Rapidly Ousting the Horse

BY OUR FOREIGN CORRESPONDENT

Owing to the conservative tendency of the Old World, it has taken fire fighting authorities in general some time to avail themselves of the obvious possibilities of power-driven fire appliances, although, if there is one branch of transport more than another where the speed of engine propulsion is of value, it is obviously in fire brigade work.

Early Experience in Berlin

Some of the earliest really practicable attempts to use motor fire engines was made by Superintendent Reichel in Hambourg in the early years of this century, but since Superintendent Reichel (who probably knows more about motor fire vehicles than any living man), was long ago appointed to the responsible position of superintendent to the Berlin Fire Brigades, we will not enter into the earliest history at Hambourg.

For the following particulars of what has been done in Berlin and Vienna, I am indebted to the courtesy of the ALLEGEMEINE AUTOMOBIL ZEITUNG of Vienna. In the early part of 1906 the city of Berlin located a grant of $12,500 for experimental work with motor fire engines, of which sum $10,000 was devoted to the building of carriages and $2,500 to the experiments, the net result of which was to prove that for city work the electric vehicle gave the best results, for long distance, steam. In these tests the steamers were built by the Carriage and Machine Factory of Bautzen (formerly the firm of Busch), and the electrics by the Austrian Daimler Company, of Wiener-Neustadt, the former affording one of the earlier examples of flash boiler and embodying condensing plant. The latter was equipped with Lohner-Porsche electric motors driving rear wheels through side chains. The most recent conclusions of Superintendent Reichel point to the use of gasoline cars for long distance work, with electricity for city work.

Comparative Cost

Comparing the two methods, steam and electric together, we get a total annual cost of $408.48 for the steam vehicle, against $286.84 for the electric.

In Vienna

These figures, though old, serve to show the relative values of the two methods. In Vienna too, although the available figures are more modern, they only carry one up to about 1908, and, therefore, it may be assumed that present day costs would be cheaper. Bearing this in mind, therefore, the following figures give an admirable idea of the relative cost of electric and horse-drawn fire apparatus.

Cost of working and upkeep for one pair horses and driver (of which for driver $319.20 and one pair of horses, about $437.99)	$757.19
Hence cost of working and upkeep of the reserve:	
One-sixth driver (every sixth day being free)	53.19
Half-pair horses	218.99
Total cost of working and upkeep for each horse-drawn apparatus	$1,029.38

The previous table showed as cost of working and upkeep, plus charges for interest and amortisation:

For horse-drawn apparatus	5,264.71
For motor fire engine	3,076.94
A saving of	$2,182.96

In Austria a kroner equals about 10 d.

It should be added that these vehicles too, were of the Lohner-Porsche type with two electric motors giving a combined horse power of 35. These are driven by cells of the Tudor type, which have given a life of 3105 miles. These batteries weigh fifteen hundred pounds, and drive the vehicle, weighing in all with its crew about 4½ tons, at a speed of 28 to 33 miles an hour.

European Method of Preventing Side Slip

In Vienna side slip has proved a difficulty, but has been overcome by fitting non-skid bands of chrome leather with hardened steel studs. One front and one back wheel, both on the same side, supplied with these non-skids effectually prevent the trouble,—but they must be both on the same side.

Berlin Electrically Driven Ladder Wagon

The motors drive the rear wheels through side chains. The batteries are carried in front over the forward wheels. The ladder apparatus is at the rear, thus the weight is equalized. Berlin prefers electrics for city work and steam and gasoline for long distances

Gasoline Car Used By Dublin Fire Department
This car is fitted with solid tires. The motor operates a turbine pump

British Development

In Great Britain the self-propelled fire engine at first followed the lines of the horse-drawn machine and was of course steam-driven. Equally of course, it was topheavy and some nasty accidents resulted in trying to turn corners at high speeds. In this respect, however, it was no worse than the old horse-drawn engines, which have a very nasty habit of "slewing" about the road way when the horses are all out.

The modern tendency is towards a powerful gasoline-driven engine with a low centre of gravity. Such a machine, dispensing at it does with the heavy boiler, can fill two purposes, for besides its powerful motor driven pump, it can carry a telescopic escape ladder and thus equal one of the old horse engines and one of the old horse aerial trucks.

The Probable Fire Engine of the Future

One of the leading officers of the London Fire Brigade during a conversation with the writer some time ago, expressed the belief that the fire engine of the future would in many ways approximate the racing car, as seems only reasonable when speed may be a matter of life or death. His idea of the future fire engine was a vehicle running on pneumatic tires with weight cut down to a minimum and a six cylinder engine of not less than 50 h. p. with ignition in triplicate. Such a vehicle of course would probably carry at least two spare wheels, for the key notes of fire service are reliability and speed.

A Fire Chief's Experience

One of the most successful fire chiefs with motor vehicles is William Frost, who for fifteen years has been chief of the Sheffield Fire Brigade. Six years ago he visited South Africa and advised the corporation of Cape Town on the organization of their brigade, and many municipalities at home and abroad have sought his advice. He is, in fact, one of the senior officers in the service and was one of the selected candidates for the appointment of chief of the London Fire Brigade.

Let me give a few figures given me some time ago by Mr. Frost. First of all, as to comparative horse and motor running, Mr. Frost's extensive experience shows that the cost per mile run with horse-drawn fire engines to be just over $3.22; cost per call just over $5.37, as against motor cost per mile of 31½ cents, these figures including depreciation and insurance on capital expenditure. The many advantages of the auto are known, but Mr. Frost mentions one that is little known.

In hilly districts like that of Sheffield, espècially on muggy days, the steam from the overdriven horses is sufficient to obscure seriously the driver's view. Needless to say this does not occur with a motor. At the present time, the Sheffield Corporation owns a large amount of automobile fire appliances as the result of practical experience, for Mr. Frost can tell of many a case when lives and property have been saved by the superior speed of the Sheffield motor fire engines and aerial trucks.

Mr. Frost, as the result of his experience up to date, represents the relative efficiency values of the motor and the horse-drawn fire brigade vehicle at thirty-four and twenty-two respectively, these figures representing the average time in minutes occupied by the two types in getting to a fire. If, however, questions of convenience, economy and so forth are introduced into the proposition, the figures will show even far more strikingly in favor of the motor.

Among the other advantages of self propelled fire brigade vehicles, the Sheffield fire chief mentions the following greater safety when traveling—no "slewing" as on horse-drawn engines—both to firemen and public. Prompt attendance, concerning which Mr. Frost refers to a fire to which he was called 18½ miles out of Sheffield. As the horses were exhausted on arrival and had to be carefully "nursed," it took 9 hours 13 minutes before the engine reached home again. Today, says the fire chief, the whole run, out and back, could be done in a little over the hour. Thirty-six miles an hour is a common speed despite the Yorkshire hills.

Obviously such speed enables rural districts around the townships to be protected much better and loss of life and property might, with the universal adoption of motor-driven fire fighting plant be thus reduced to a minimum.

The work, too, in looking after horses is seldom realized in fire work. They often get very hot and have to be rubbed and cooled down very carefully and slowly, besides being carefully groomed and dried.

The Berlin Steam Fire Engine
This apparatus is used mostly for long-distance work

Gasoline Engine Starters For Commercial Cars

A Review of the Automatic Engine-Starting Devices Applicable to Commercial Cars

NOW that the automatic starting device has reached such a state of perfection on pleasure cars, it well deserves the favorable consideration of the commercial car user. It is an easy matter to realize the saving of fuel, as well as wear on the power plant, the attachment of automatic starting devices would mean to the owner of a fleet of commercial cars. It is quite a common occurrence to see a merchant's delivery car or a truck standing at the curb with the motor running while the driver is making delivery or unloading freight.

It is only human nature for the driver of a commercial car to avoid the necessity of cranking the motor and the possibility of personal injury caused by a back kick. Consequently the motor is allowed to run almost continually during the day's work.

There are a number of types of automatic or self-starters, which can be operated from the seat. The most important are as follows:

The compressed air starters, in which air is compressed in a storage tank, either from the engine direct, or from an independent air compressor, and then distributed to the cylinders in their order of firing.

This causes the engine to turn over until it fires:

The acetylene gas starter, in which gas from the ordinary gas tank, under pressure, is distributed to the cylinders direct or through the intake manifold, or by pump, and ignited:

The electric type which uses a motor-generator to turn the fly wheel by means of gears, and after the engine is started, recharges the battery:

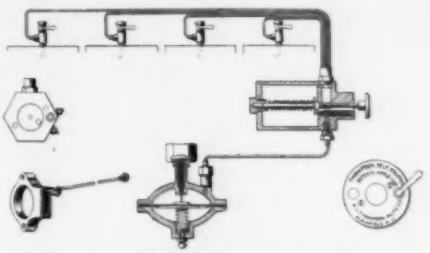
The spring type in which powerful springs are employed and operated from the seat, and the lever type, starting from the seat by means of a pedal or lever connected with a clutch or ratchet movement on the fly wheel or other suitable point.

The automatic starters reviewed in this article are manufactured by concerns making a specialty of them and are available for any make of gasoline commercial car.

THOMPSON SELF-STARTER

The Thompson Self-Starter, manufactured by the Andrew C. Thompson Automobile Company, 413-421 Park Avenue, Plainfield, N. J., is very original. To operate, push the button, thus delivering a measured amount of gas to the cylinders. It does not matter how long or short a time this button is held. The head lights may be turned on and off from the dash, and a self-lighting system is furnished with this starter at a small additional cost. The pressure regulating valve adjusts the pressure regardless of tank pressure both for starter and the head lights.

The air valve shown is inserted between the carburetor and the intake manifold and instead of stopping the motor by throwing off the switch, simply push the foot button opening the air valve, allowing the motor to stop filled with pure air, so that when the gas is injected the mixture



Thompson Self-Starter and Self-Lighter
Showing starting valve; regulating pressure valve; and air valve to insert between the carburetor and the intake manifold

is not too rich. The air valve makes the mixture conditions the same at all times.

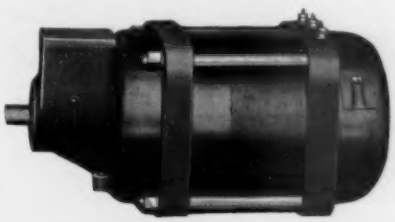
The price of the Thompson Self-Starter is $30. Self-Lighting System $10 extra.

THE APLCO ELECTRIC SELF-STARTER

The Apple Electric Company, of Dayton, O., is making an electric self-starting device for application to any motor car. The apparatus combines four important electrical functions for the automobile, namely, self-starting, ignition, lighting and signaling. It consists of three units: A combined motor and dynamo, a controller and a storage battery.

The dynamo-motor, as shown in the illustration, is attached to the engine by means of a side shaft or through flexible gearing and flanged sprockets, and may be applied to any available point along the crank shaft or propeller shaft. Contained in the head of the dynamo-motor is the reducing gear mechanism and clutches which are automatic in their action.

No part of the apparatus is placed on the dash of the car. The controller, which is the vital part of the system, is placed on a panel under the driver's seat and contains the controlling switches for all the electrical appliances used on the car. The starting lever, the ignition switch, the controlling switch for the lights, and button for the electric horn are all combined



The Aplco Electric Self-Starter
The Aplco combined motor and generator which is used with the Aplco self-starting equipment. Attachment is made by means of a side shaft or through flexible gearing and flanged sprockets, and may be applied to any available point along the crank shaft or propeller shaft.

in one unit and are instantly accessible to the driver. A pilot light on the controller box indicates by its glowing that all parts of the system are working properly.

The storage battery is a twelve cell unit, arranged in four groups supplying 6 volts each. It weighs approximately 100 lbs.

By the simple pulling of a small lever on the controller the starting motor drawing current from a storage battery is set in operation, acting through the reducing gear and turns the engine over at the rate of 25 to 50 r. p. m. for a period of 40 minutes, if necessary. As soon as the engine is running on its own power the automatic clutch releases the reducing mechanism and the machine is driven as a dynamo at engine speed, furnishing the current for ignition, lighting and keeping the battery charged. The apparatus is so arranged that it is impossible to throw the starting mechanism into operation until the spark is retarded and the transmission is in a neutral position.

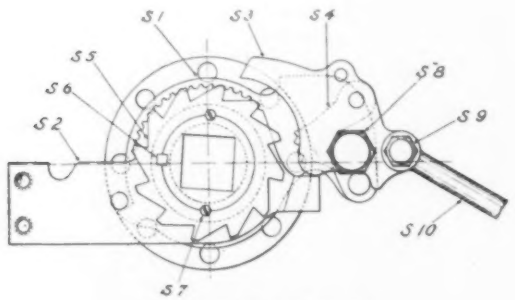
It is supplied with an entirely new type of regulator from that heretofore used with the Aplco electric lighting system, so that at a speed of the car approximating 10 m. p. h. the dynamo furnishes the lights and ignition current without drawing on the battery. It is claimed that it is so sensitive that a single two candle power lamp can be burned on the current supplied direct from the dynamo without storage battery being connected.

The dynamo-motor complete measures 7 3-16 in. in diameter by 18 in. in length over all and weighs approximately 70 lbs.

THE SIMPLEX SELF-STARTER

The self-starter manufactured by the Simplex Manufacturing Company, Anderson, Ind., is operated by means of a pedal which can be placed in any convenient position on the toe board.

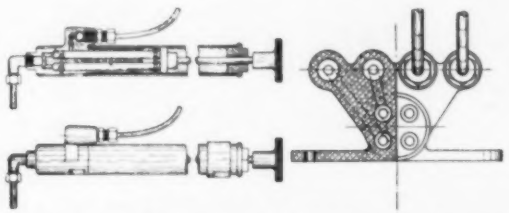
Working in conjunction with the starter is a small hand priming pump. This pump draws gasoline from the main supply line, bringing it in through the bottom and up into four cylindrical chambers ready to be forced into the motor cylinders. With the downward stroke of the pump four pistons working in the cylindrical chambers spray the gasoline in equal proportions to each motor cylinder.



The Simplex Self-Starter

It is operated by a pedal connected by suitable cranks to pawl S 3, so that by a forward motion of the pedal the pawl will engage in ratchet S 6 and rotate the motor. Should the motor for any reason, back-fire, pawl S 4 will engage in notches on stationary disc S 2 and disengage pawl S 3 from the rachet S 6 and allow the motor to rotate in a reverse direction with absolutely no chance of injury to the operator or the mechanism.

After the cylinders have been primed the motor is then started by rotating it with the above mentioned pedal. If for any reason the motor does not start, it can be turned as many times as it is necessary by the pedal without the driver leaving the seat. In extremely cold weather, after the motor is started, it can be kept running by feeding gasoline through the priming pump until it warms up sufficiently for the carburetor to take hold.



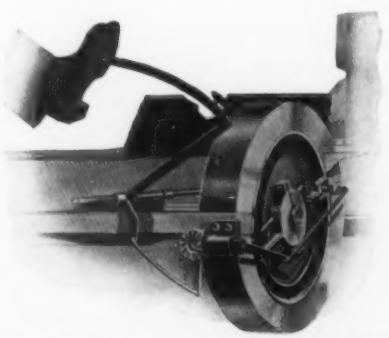
Priming Pump For the Simplex Self-Starting System

Section showing construction of priming pump with four cylindrical chambers, each chamber supplying a separate cylinder with the priming charge of gasoline.

With this system it makes no difference if the motor stops on center or in such a position that the points in the circuit breaker are closed so a spark cannot be had, as it is started by being rotated mechanically, allowing the spark to take place in the compression cylinder the same as it would if the motor was started with a crank in the usual way.

THE GLENARD FOOT-LEVER "ENGINE STARTER"

The Glenard Starter, made by the National Motor Device Company, 1118 South Michigan Avenue, Chicago, Ill., is operated by a pedal and is attached to the fly wheel. When the pedal is pressed, a small cam expands a clutch rim in the fly wheel making connection between the fly wheel and



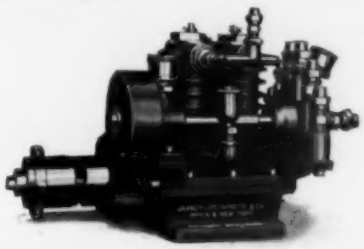
The Glenard Foot-Lever "Engine Starter"

Phantom view showing the installation and construction of the Glenard Starter, operated from the seat by a pedal and is attached to the flywheel. Its operation is clearly shown in this illustration.

the pedal. By means of bevel gears and linked rods the fly wheel is revolved by the foot pressure on the pedal. Normally the two clutch rims are held away from the fly wheel by means of a coil spring. The whole device is mounted on roller bearings. The price is $100, and may be applied to any car.

THE JANNEY-STEINMETZ COMPRESSED-AIR ENGINE SELF-STARTER

The Janney-Steinmetz Company, Philadelphia, Pa., is offering to the trade a compressed air engine starting outfit suitable for commercial cars, which automatically starts the engine by the pressure of a button. The device, in all its functions, is controlled by the driver from the seat. The outfit consists of a pump distributor, a seamless steel air tank, an air or throttle valve, cylinder valve, one for each cylinder, and an air pressure gage.



The Janney-Steinmetz Compressed-Air "Engine Starter"

The Janney-Steinmetz self-starter is of the compressed-air type and consists of a pump distributor; a seamless steel air tank; an air or throttle valve; cylinder valves, one for each cylinder; and an air-pressure gauge. The pump distributor unit consists of a two-cylinder pump, with a multiple-port distributor mounted thereon. The distributor rotates continuously with the motor at cam-shaft speed, while the pump is thrown into and out of action as required.

The device is small, light in weight, efficient and it is claimed unfailing in operation.

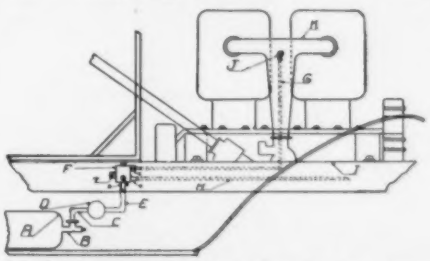
The base of the starter is less than 5 in. square; the compressor with its rotor, gears and valves having a width of 7 in. and length of 8 in., and weighs less than 20 lbs. The single cylinder model weighs less than 10 lbs.

The tank can be made to a size to suit the desired location on the chassis. The gage on the dash registers the effective working pressure, starting the engine from 150 down to less than 50 lbs.

The price of this starter is $100, not including copper tubing and air tank.

INSTANTANEOUS ACETYLENE-GAS "ENGINE STARTER"

The Instantaneous Auto Starter Company, Winton Place, Cincinnati, O., are makers of the device of the same name, which is of the type which uses the acetylene gas out of the regular tank, introducing it into the intake manifold. It is not intended to be operated from the seat. As will be seen from the drawing, there is a rubber bulb "D" between the gas tank, and the starter valve; by pressing this bulb all air is forced out of the passage between valve "F" and gas tank "A"; on releasing it a vacuum is formed. The valve "B" is then gradually opened until the bulb has resumed its natural outline. The valve "B" is then turned off, before opening the starter valve "P." This outfit is sold for $10.



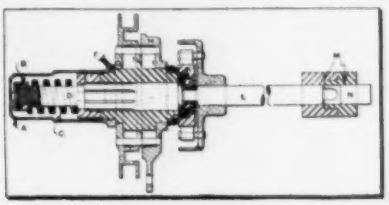
The Instantaneous Acetylene-Gas "Engine Starter"

A, acetylene tank; B, valve; C and E, rubber tubing; F, starter three-way valve; C, quarter-inch brass tubing to J; H, tube to headlights; J, brass L ⅛ I. P. S.; K, engine manifold.

THE STAR LEVER "ENGINE STARTER"

The Star Starter Company, 170 Broadway, New York, N. Y., is the maker of this hand lever starting device which starts from the seat.

It consists of a disc attached to the crank shaft, over which runs a chain leading over two pulleys to a lever at the driver's seat. A sharp pull on this lever turns the motor.



The Star Starter

The Star Starter attached to a car. The chain shown in illustration leads over two pulleys to a lever convenient to the driver's seat. A sharp pull on this lever turns over the motor. Two or three pulls in quick succession will spin the motor.

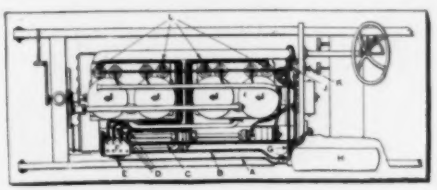
When the lever is pulled back the axial motion of a screw attached to it imparts a rotary motion to a nut and a connected socket pinion, turning the starter drum. When the lever is released a spiral spring draws the drum back to its original position. Inside the drum is a sleeve with a ratchet and four pawls to prevent it from turning backwards.

The starter and the driving shaft of the motor are at all times engaged when the motor is at rest and, therefore, by the first pull of the lever the motor is bound to be turned. When the motor starts to revolve the driving shaft is disengaged from the starter by centrifugal force.

A series of two or three pulls will spin the motor. The price is $75 for all sizes.

THE START-LITE COMPRESSED-AIR "ENGINE STARTER"

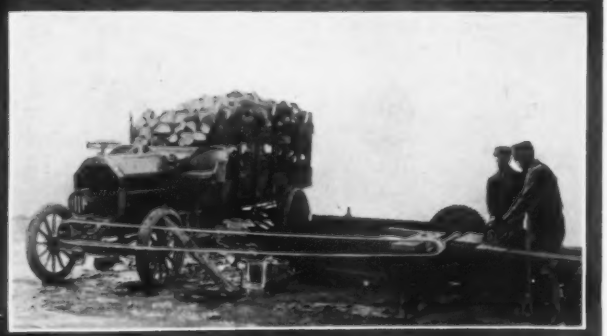
The Start-Lite Company, 1502 Michigan Avenue, Chicago, Ill., is marketing the Start-Lite Compressed Air Engine Starter. The main feature of this starter is an air compressor, motor and a distributing valve operated by cams forming one unit, which can be attached to any engine wherever either the cam shaft, pump shaft, magneto shaft, or the main crank shaft is accessible, so as to get the proper turning from the engine.



The Start-Lite Starter

A, pressure tube from tank; B, inlet tube to tank; C, inlet tube from master valve; D, tubes to cylinders; E, diaphragm governor; F, combined air compressor and distributing valve; G, check valves; H, tank; I, air gauge; J, master valve; K, push button; L, inlet valves.

(*To be continued*)



COMMERCIAL CARS ON THE FARM

The Horse Fast Disappearing From His Last Stronghold, the Farm. Gasoline and Oil Engines Supply Power For All Kinds of Farm Work

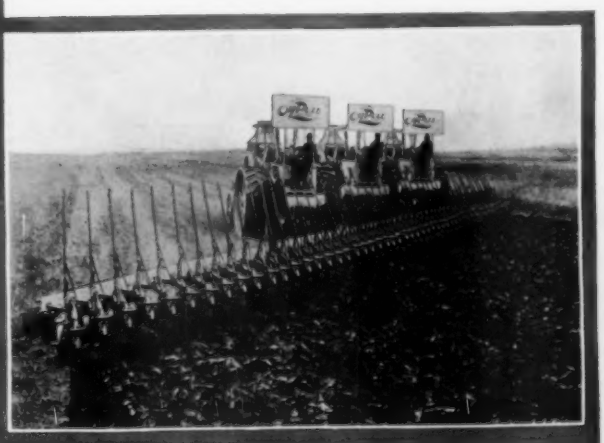
In the accompanying illustrations are shown some of the marvelous performances accomplished by these modern farm horses. One of these machines, in particular the Avery, looks like an ordinary truck, but is fitted with a pulley at the front for power driving by belt all kinds of farm implements. It is also fitted with special wheels so that it can negotiate soft roads and fields. One view shows it hauling two trailers with 198 bushels of wheat six miles in 57 minutes, another shows the machine sawing wood and hauling it away, and another shows it pulling two discs.

A machine known as the Big Four "Thirty," manufactured by the Gas Traction Company, of Minneapolis, Minn., is largely used for heavy farm work, and is shown in the accompanying photographs threshing 2500 bushels of wheat per day. The work which can be accomplished by a group of such machines is almost beyond belief. Four of these machines, each pulling six 8 ft. cut binders, can move across the face of one of our boundless western farms, cutting at one stroke a swath 192 ft. wide.

In another picture three "Big Fours" are seen operating gang plows. This machine can operate on gasoline, kerosene, benzine, naphtha, distillate, or any of the other fuels ordinarily used.

Hart-Parr Company, of Charles City, Ia., manufacturers of cooled gas tractors. In an accompanying photograph a Hart-Parr tractor is shown hauling hay at Charles City, Ia. The hay racks are each 9 x 20 and carry 2 tons. The cost of operation in this case was as follows:

Fuel, 40 gallons, at 4c	$1.60
Oil, 1½ gallons, at 40c	.60
3 men, at $2.00	6.00
Total	$8.20



Feed for 3 teams, at 75c	$2.25
Wages for 4 men, at $2.00	8.00
Total	$10.25

Average Cost per Day About.

60 gallons Distillate, at 5c	$3.00
1½ gallons Oil, at 40c.	.60
Engineer (with Board)	3.50
Plowman (with Board)	2.00
Total	$9.10

One wagon unloading while other is being loaded.

To haul same amount of hay with horses would have required two wagons and drivers with an extra field team and driver and extra pitcher.

The engine has two speeds, 2¼ and 4 miles per hour, the slower speed for hauling when loaded. Three men and the engine took hay from the windrow and hauled it 1½ miles to the barn faster than 3 men could unload it and mow it away. In another view the same machine is shown breaking, discing and packing simultaneously, covering daily an average of 15 acres. The costs, with a comparison of the cost of doing the same work with horses, are as follows:

Average per acre, $0.607.

To do this with horses would figure as follows:

3 men with gang plows and 18 horses, 1 man with Disc harrow and 3 horses, 1 man with packer and 4 horses, feed for 25 horses, at 37½c	$9.37
Board and wages for five men, at $2.00	10.00
Total	$19.37

Average per acre, $1.29.

Another manufacturer of prominence is M. Rumley and Company, La Porte, Ind. Their machine is known as the Oil Pull Tractor. Three of these are shown hauling a gang of fifty plows, doing easily work which could not be accomplished by a large number of horses. Such tractors do all kinds of work, including not only pulling plows, harvesting machines, discs, packing and seeding machines, manure spreaders, etc., but also for driving threshing machines, feed cutters and even supplying power for the machine shop.

Some Examples of Recent Power Plant Mountings

C. T. SCHAEFER, Member Society of Automobile Engineers

PROBABLY no single feature of commercial car design merits more careful attention than does that of mounting and arranging the power plant, in such a way as to offer to the user power plant accessibility and life, in the greatest degree consistent with reasonable compact design. The importance of the first point will be admitted by all, and as considerable mention has been made of the advantages and disadvantages of the various power plant arrangements, in the various leading trade journals, it would be useless to again take up the subject here, it being the object of the writer to take up the subject of power plant mountings as presented at the recent commercial car shows.

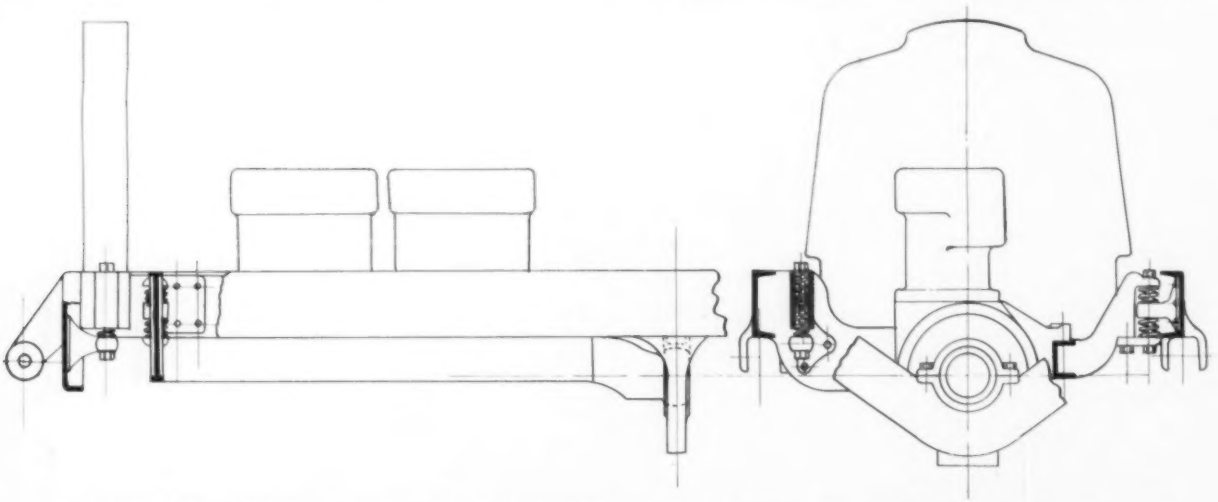


Fig. 1 depicts the method of mounting the power plant in the United States trucks. The motor is mounted on a subframe, the front cross member of which extends into the side frame members. This cross member is mounted on heavy coil springs, to relieve the power plant of severe shocks and vibration. At the rear of the motor is riveted to the subframe a cross member which forms a 5-in. spherical bearing for the rear support, on a large cross member, being dropped considerably in the center. The support is on the upper side of the member; thus the motor has a very flexible mounting, being relieved of vibration and the stresses due to main frame twisting, when the road wheels mount an obstacle in the road. The feature of flexible mounting is also applied to the transmission, which has a 5-in. spherical bearing at its three points of support, a large dropped cross member being used at the front end, while the two spherical bearings at the rear are formed over the jack-shaft housing. It will be noted that all these spherical bearings and the front spring supports are provided with caps to facilitate the rapid removal and replacement of either unit. Brackets extend from the subframe, which carry the muffler, then by eliminating the universal coupling in the exhaust pipe line, the muffler being mounted crosswise under the driving shaft just back of the clutch.

The subject of vibration so common in motor trucks suggests the supporting of the motor on a frame having a spring support, relying upon the springs to absorb much of this vibration. The number of makers employing this method is indeed limited. Most makers contend that there is little to be gained in providing a flexible support for the motor. However it is not to be denied that for certain classes of heavy truck work this system presents some advantage. The desirability of obtaining long life for a power plant will be endorsed by all commercial car users, and the writer is of the opinion that providing a flexible mounting for the motor is a thoroughly practical feature, and that it is a step toward prolonging its life, specially when it is considered that this method adds very little to the cost of manufacture and is a step toward reducing maintenance cost under severe operating conditions, such as hauling coal and lumber from railroad yards, when roads are very poor, to delivery points in the country, often being required to make the entire trip over rough granite block streets, at a good speed. Another factor which must be taken into consideration is the fact that motor truck springs are made much heavier and are not near as resilient as pleasure car springs, and therefore the power plant must resist more severe vibrations. The tendency of operators and owners to overload and to operate the truck at a high rate of speed also reduces the spring efficiency. However, both of these features are partially overcome through the governor and auxiliary rear springs over the rear axle. In some cases the sub-frame is rigidly fastened at one end and provided with some sort of a universal coupling at the other end. However the tendency of the present day is to mount the motor directly on a sub-frame, which is rigidly fastened to the main frame on both ends and the provision of a 3 point support for the transmission.

These transmission mountings were in some cases flexible at all these points, while in others the jack shaft ends were rigidly mounted, the front end having a suitable flexible support. There are also some in which a torsion rod forms the front support and have rigid jack shaft end supports. Another class is the unit power plant with sub-frame mountings. However, this latter method was not very much in evidence on the heavier types of trucks.

Past experience has taught truck makers that main frame mountings can not be resorted to, unless combined with some flexible support. A rigid main frame mounting has been the cause of many broken crank case arms, during the introduction of the commercial car some years ago.

Two of the Six Fully-Proven "Firestone" Truck Tires

Hard Base—Channel Type
Furnished in Single or Dual Form

Side-Wire Block
Dual Form for Rear Wheels

Ten years' experience as leaders in motor truck tires is back of Firestone Truck Tires and Rims. Ten years of progress, step by step, has perfected them. Firestone, and not Firestone customers have paid for the experimental stage in all Firestone Tires and Rims.

We have a fully-proven tire for every Car, Load and Condition of Service. On regular rims or on Quick Removable rims for quick tire-changing *right on the spot.*

Hard Base—Channel Type

For resiliency in heavy service. This tire is vulcanized firmly into a channel with saw-tooth base. Consists of an extremely tough tread, cured to a hard rubber base.

The up-turned sides of the channel ensure the firmest possible base support against the tire working or tearing loose. Flat bands expand when in service, loosening the rim and tire; but the Firestone channel is too rigid to expand. At the same time it protects the rubber from side abrasion and allows it to wear down as long as there is enough left to give resiliency.

Side-Wire Block Tire

For traction, non-skidding and resiliency in heavy service. Has a continuous base, preventing abrasion from metal plates, as in other tires of this type. Worn or damaged blocks may be removed and new ones substituted without impairing the tire's strength.

Like the Hard Base—Channel type, it has all the advantages of Firestone quality of rubber.

Quick Removable Rim

Over two years in successful use. The original and *only perfected* one of its kind. Does away with vital weaknesses now in others. Accomplishes *in practice* just what we say *on paper:* "Enables the driver to make a quick tire-change right on the spot. Does away with lay-ups for tire-changes."

Write for full information and guarantees.

The Firestone Tire & Rubber Co., Akron, Ohio.

"America's largest exclusive tire and rim makers"

More Than 100 Service Stations for Truck Tires.

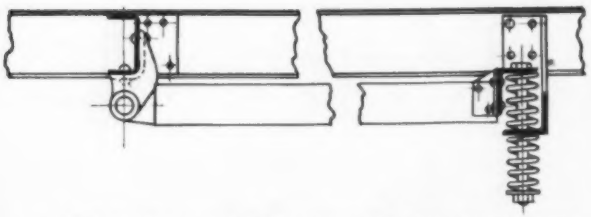


Fig. 2 depicts a somewhat different type of flexible sub-frame mounting used on the heavy Sampson trucks. This sub-frame is carried on two heavy coil springs placed very close to the center of the starting crank. Two angle cross members are used, one being riveted to the two sub-frame members, the other being dropped below the sub-frame and extending to the side frame members. Between these two members the coil springs are placed. Below the lower member two coil springs are placed, which check the movement of the frame, acting against the two upper springs. This arrangement is retained by two long bolts, washers and nuts. The movement permitted by the springs at the front is taken care of by the use of a hinged support at each end of the sub-frame members in the rear, being formed on a cross member. In this way the motor is relieved of vibrations by the double spring arrangement, and also of frame twisting, owing to the proximity of the springs to the center of the motor. In the exhaust pipe line is placed a universal coupling to take care of the variations in the relative position of sub-frame to main frame, the muffler being suspended from the main frame. Three-point suspension is resorted to in mounting the transmissions on these trucks.

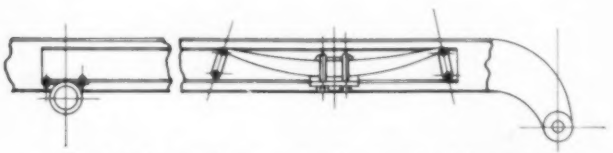


Fig. 3 depicts another type of spring mounting, being used on the Stearns five-ton truck. In this type the power plant is mounted on a sub-frame, which is suspended at the front end on both sides on semi-elliptic leaf springs independent of the main frame and springs of the truck itself. These springs are anchored to brackets extending from the main frame members by the usual spring clips, while the ends are attached to the sub-frame through the usual shackle links and belts. The rear support is formed by brackets having a bearing on the jack-shaft housing.

The rigid frame mountings having been thoroughly illustrated in trade journals, the writer will confine his illustrations to the two types of flexible mountings, i. e., the sub-frame types mounted on springs and those provided with a pivotal coupling at one end.

In the Lozier five-ton truck a mounting similar to Fig. 3 is employed, differing in that the spring is attached to the sub-frame at its center and the ends rest on brackets extending from the main frame members. The rear of the sub-frame has a cross member which carries two brackets that form a hinge supported on a main frame cross member. This type has the advantages of those mentioned above, and in addition to these it also has the feature of providing a comfortable seat for the operator, as his seat is mounted on this sub-frame. In the special Reliance truck the main frame is carried very low, being arched over the rear axle and having the spring attached to the under side of the axle. The motor is carried on a sub-frame which is rigidly fastened to a cross

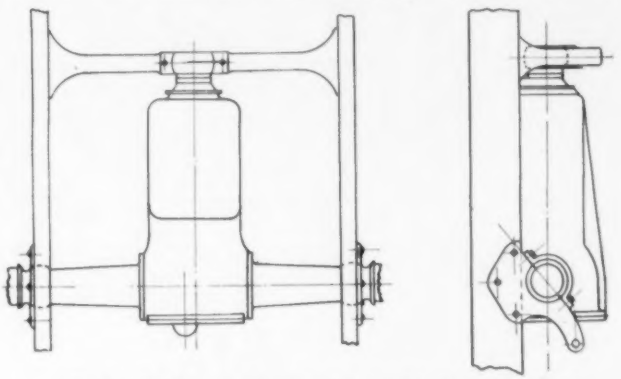


Fig. 5. Another type of support is depicted in the Locomobile five-ton truck, in which the motor is mounted on two trunnion supports, one at each end, and attached to the main frame members, while the transmission has a trunnion support attached to a cross member at the front end and the usual mounting at each end of the jack-shaft housing.

member in front, while at the rear a large tubular bracket is riveted to the sub-frame member ends. This bracket has an extension which passes up into the forked bracket, riveted to a main frame cross member. This extension pivots on a large pin which passes through brackets and is retained by a castellated nut and cotter pin. This cross member is strengthened at this point by a large plate on one side and the forked bracket on the other. One set of rivets is used to combine the three parts, to eliminate holes as much as possible. This large tubular bracket must also form a housing for the clutch shafting bearing, in order to maintain its alignment. The transmission is mounted on three points, having a bearing at the jack shaft ends and a clevis joint suspended from a cross member at the front.

The method of transmission mounting is also used on the Mogul, Harder and other trucks using this same make of transmission.

In the new Smith three-ton truck the motor is mounted on a rigid sub-frame, while the transmission is mounted on a large torsion tube extending from the worm drive housing, the

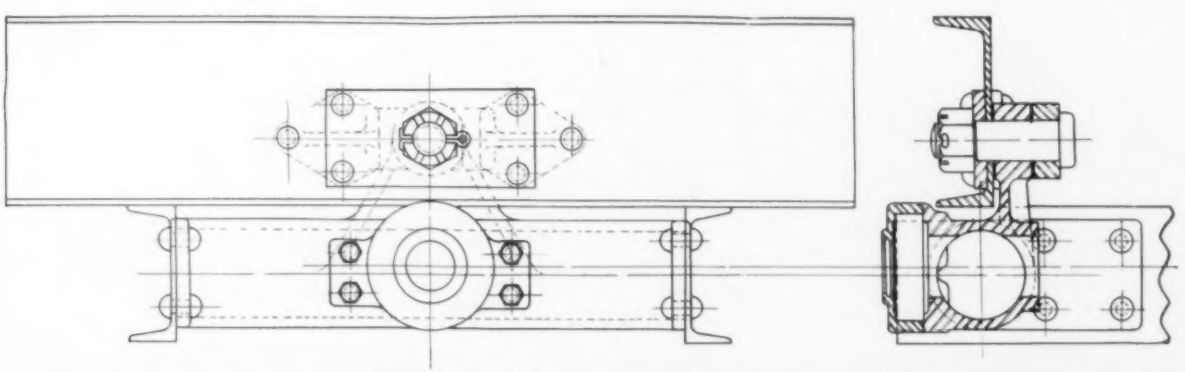


Fig. 4 depicts the support of the Reliance sub-frame, while a similar support is used in the Gramm trucks, in which this support is placed at the front end instead of the rear end, the sub-frame being of angle section and bent to form its front member, to which is riveted the supporting bracket, three-point suspension being resorted to for transmission mounting.

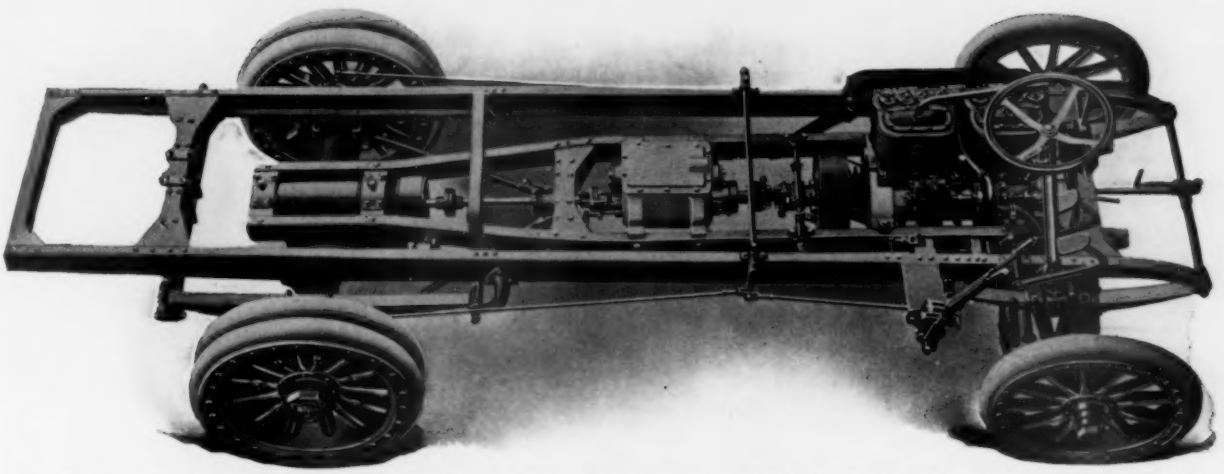


Fig. 6. In the Blair trucks a sub-frame is used for carrying the motor and transmission, which is hinged at two points on a cross member in front and extends back to the rear axle housing for the rear support, giving the advantage of a straight-line drive, as the truck is shaft-driven through a worm-drive rear axle. The reason advanced for this construction is the elimination of universal joints, owing to the difficulty in providing efficient lubrication for them in truck operation.

front end of the transmission being pivotally mounted upon a cross member.

In conclusion the writer might add that the subject of power plant mountings has apparently been given careful study by engineers in general. This is evident by the variety of forms seen in current practice.

Natural Gas As a Fuel For Commercial Cars

One of the most novel developments in the commercial car field is the perfecting of a system by which natural gas, such as is obtained in large quantities in many parts of the United States, can be used for fuel instead of gasoline. This system has been perfected by the Packers Motor Truck Company of Wheeling, W. Va.

During the recent New York Shows this company had on the streets one of its Packers two-ton trucks, running on natural gas. Contrary to what might be supposed, the use of natural gas as a fuel does not in any way complicate the present truck mechanism. In fact, it would require a very close inspection of the vehicle to perceive anything whatever unusual about it. The ordinary gasoline tank is used as a reserve, and it is perfectly possible as was demonstrated to the writer, to instantly shift the engine over from one fuel to the other.

Neatly stowed away under the overhanging body at the rear are three natural gas bottles which are very similar to Carbon Dioxide tanks. These are connected by a common pipe to a reducing valve fitted with an ordinary pressure gage which can be set at a hundred pounds or any other desired pressure. The gas from the bottles which is at a pressure of about 1500 lbs. to the square inch, is brought down in one step to 100 lbs. pressure, and from this point passes through what is called a regulator, coming out through a pipe into a device which corresponds to a carburetor, at a pressure of only two ounces above gage or atmospheric pressure. At this point, after the usual fashion, the gas is mixed with air, and this mixture is drawn into the engine on the suction stroke.

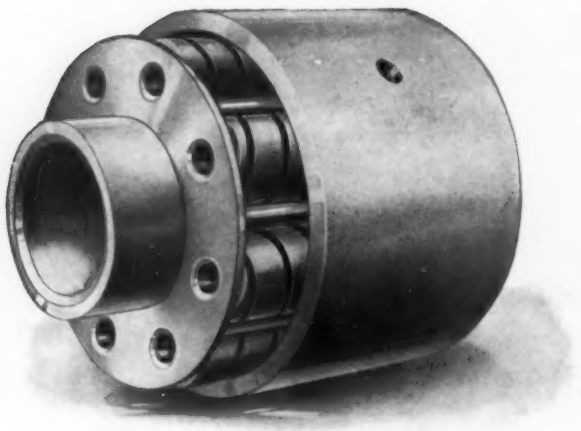
This gas contains approximately 23,000 heat units per pound as against 18,000 for good gasoline, and it may be mentioned that good gasoline is something the motorist of today practically never sees. Natural gas requires, for complete combustion, 25 parts by volume of air to one part of gas, which is almost three times as much air as is used when burning gasoline. In other words, only one-third as much gas is used as would be the case if gasoline were the fuel, and this being in the form of a gas to start with, mixes very much more readily with the air than liquid gasoline would do.

The only change that is required in the engine to use the gas is in the carburetor, a special one being supplied which will permit of the use of either gasoline or natural gas or both together. On the side of the machine on the running board is a small box in which is an ordinary gas meter, which shows how much gas has been consumed, and there is also a small gage which shows the number of inches of vacuum in the pipes leading from the tanks to the carburetor. This vacuum is caused by the suction in the engines, and is maintained by the automatic closing of a small valve in the carburetor when the engine is not in operation.

According to statements made by President A. M. Schenk, each of the gas bottles contains approximately 140 cubic feet of natural gas at a pressure of about 1500 lbs. to the square inch, so that the volume of gas carried on the truck, with tanks full, is 412 cubic feet. This is sufficient to run an ordinary two-ton truck with load under average road conditions, from 35 to 45 miles, and when it is mentioned that the gas is sold to the consumer in the bottles at from 10 to 20 cents per 1,000 ft., it will be seen that the cost of the total supply carried for 35 to 40 miles running, is less than 10 cents.

CLASSIFIED ADVERTISEMENT

THE MANAGEMENT OF A HIGHLY SUCCESSFUL motor truck company wishes to get in touch with financial interests capable of financing a reorganization of an industry in exactly the right condition for enlargement. About 100 trucks have been built and tried out. Business in sight demands additions to plant and warrants more complete organization of all departments. Address "MOTOR," care of this Journal.



"WE HAVE HEARD

of a roller bearing that relieves the strains and cushions the shocks and we have instructed our engineers to investigate, for we want our truck to lead the rest."

"Commercial cars are subjected to strains and treatment that the pleasure car never undergoes."

"Above everything else in importance is the matter of bearings. The best bearings made are none too good for truck service. We want our truck equal to and better than any other —therefore the best must be used."

Hyatt Roller Bearings meet every requirement of truck service better than any other bearing. Already ninety-three of the most prominent commercial car builders have decided that the Hyatt bearing secures for them maximum bearing efficiency.

The Hyatt organization, with its engineers, will be pleased to co-operate with you in working out your bearing problems.

HYATT ROLLER BEARING CO.

DETROIT, MICHIGAN

J.S.BRETZ COMPANY

F&S

Annular Ball Bearings

Directions for
Mounting, Care and Treatment
with Examples of Design
of the Patented
Fichtel & Sachs Ball Bearings
and also
Thrust and Double Thrust Bearings

SOLE IMPORTERS

APRIL, 1912

JUST OUT

MAY WE SEND IT TO YOU?

THE illustration above is a full-sized reproduction in black and white of the cover of a very interesting twenty-four page booklet just off the press, and the title page tells its own story, but to which we have added a chapter on Lubrication. The text, illustrated by thirty drawings, is printed in black on heavy, coated, india tinted paper with the borders in brown, the whole forming a simple, practical, elementary treatise on the subject, and which should be carefully read and studied by those interested in the conservation of energy by the application of ball bearings to revolving parts.

J. S. BRETZ COMPANY
SOLE IMPORTERS
F & S Ball Bearings
250 West Fifty-fourth, New York

CCJ Please send Booklet to

Name . . . . . .

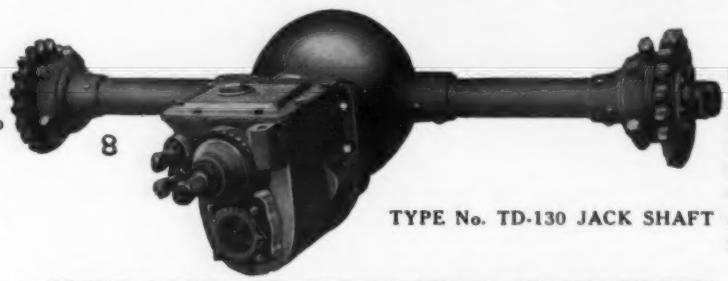
Address . . . . . .

SHELDON

ONE TON EQUIPMENT
It's Ready For You

When we say this equipment is ready, we mean it has been thoroughly tried out, and that we are in a position to accept orders for prompt shipment.

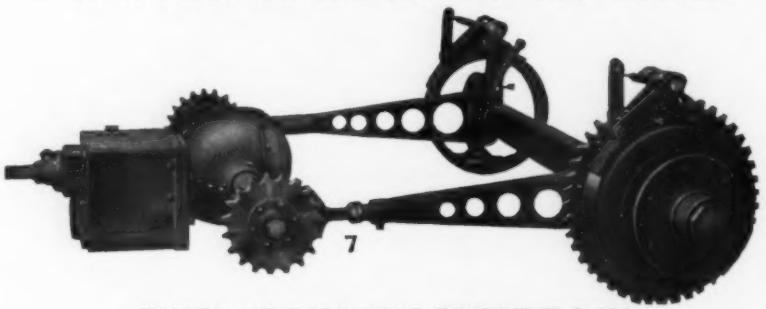
Radius Rods Designed to take care of all operating conditions



TYPE No. TD-130 JACK SHAFT

14 Inch Brakes, Pressed Steel Drums, with sprockets riveted on

A VERY COMPACT SUBSTANTIAL PROPOSITION



BRAKES AND RADIUS ROD EQUIPMENT D-132

Our One Ton Front Axle is I-Beam style with spring pads forged integral. Rear Axle also has integral spring pads.

We furnish a standard set of springs to go with this One Ton Equipment.

Order Axles, Jack Shaft, Transmission, Brakes, Radius Rods and Springs all from one source—one shipment.

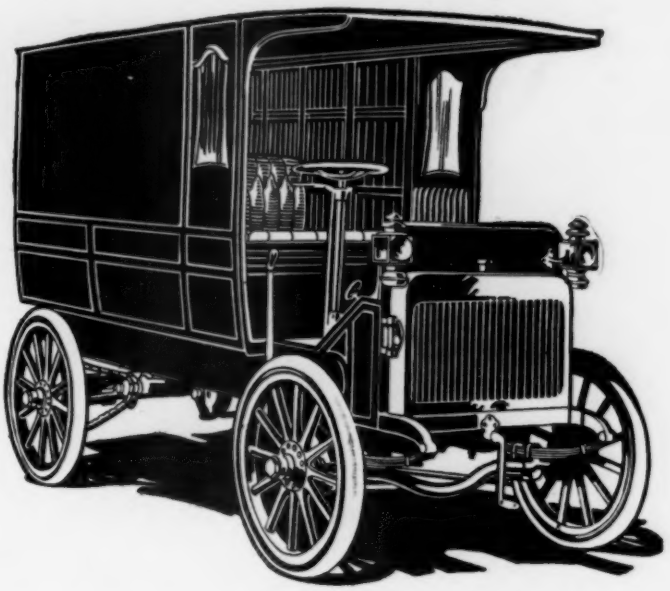
Our Bulletins Give Facts Worth Getting

SHELDON AXLE COMPANY
WILKES-BARRE, PA.

Branch Office
68 East 12th Street
CHICAGO

Branch Office
1215 Woodward Avenue
DETROIT

Cartercar



The "Cartercar" Truck

Open body------equipped---$1250
Screen sides ---equipped---$1300
Full paneled ---equipped---$1350

The Cartercar Truck is unusually well adapted for the hard use of a commercial vehicle. It has all the features of construction which have made the Cartercar pleasure cars famous the country over for the perfect service they give.

The patented Friction Transmission makes the Cartercar truck especially good for parcel deliveries. There are no jerks or jars in starting or changing speeds. Besides this transmission affords the most simple control—the unlimited number of speeds being governed absolutely with one lever. This simple control with any number of speeds makes this Truck ideal for crowded busy streets. And another thing, this transmission is so reliable and durable that no matter how inexperienced the driver he will not be able to injure it in the least.

If you want service—every day in the year—to have the satisfaction of knowing that your deliveries will always be on time—then you should have a Cartercar.

Let us send you complete catalog

Cartercar Company

Pontiac, Michigan

Branches: Detroit, Chicago, Kansas City and New York

THE DEPENDABLE KIND—

F & S

Annular Ball Bearings

MADE IN SCHWEINFURT, A-M, GERMANY

The F & S 1912, 134 page, illustrated catalog de luxe of the world's quality ball bearing is free by mail for the asking. May we send it to you? The tables in it are valuable—it is really a handy text book for your files—

J. BRETZ COMPANY
SOLE IMPORTERS
F & S Ball Bearings
250 West Fifty-fourth, New York

Send us your blue prints, specifications and photos, and we will submit, without charge, a blue print of a detailed ball bearing construction to replace your plain bearing journal.

Panel body; Four cylinder, 20 H. P. Motor; Bosch high-tension magneto; Pneumatic tires, 32 x 3½ in., price complete, $850; Solid 2½ in. truck tires, price complete, $800.

Here is the 1912 Sensation of the Motor World

COMMERCE CAR

Dealers in all parts of the country are already reaping a harvest from sales of the Commerce Car.

We have some choice territory left for good, active dealers. Do not let this great opportunity pass you buy.

Write us for territory and dealer's proposition

The Commerce Motor Car Company
General Office, 633-639 Penobscot Bldg., Detroit, Mich.

The Heart of 300 Commercial Car Catalogs on One Sheet

Table of Specifications of 1912 Gasoline Commercial Cars

Printed by the Publishers of THE COMMERCIAL CAR JOURNAL IS NOW READY

TELLS AT A GLANCE Type of Engine, Bore and Stroke, Ignition, Oiling, Cooling, Transmission, Drive, Axles, etc., as well as Brake and Clutch Lining Materials, Brake Area, Number, Size and Threads of Spark Plugs, Type of Rims, Size of Loading Platform, Height of Platform, Amount of Rear Overhang, etc., etc., enabling a RAPID COMPARISON OF ONE TRUCK WITH ANOTHER.

This invaluable table will be mailed to any address upon receipt of $1.00 (stamps accepted)

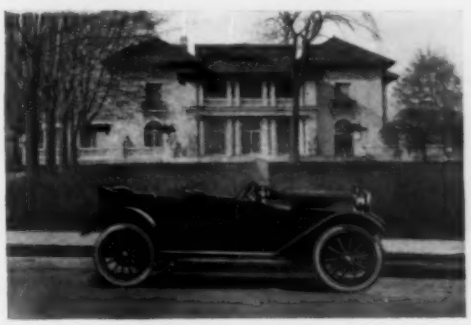
CHILTON COMPANY, Market and 49th Streets, Philadelphia

CHILTON ADVERTISING POST CARDS=*In Colors*

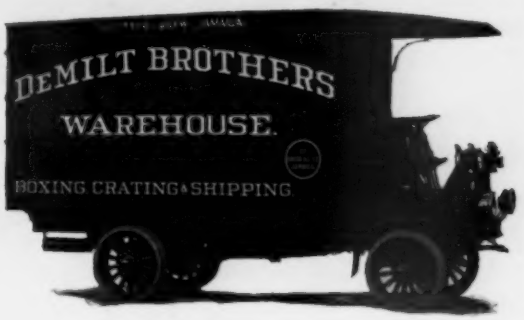
Are producing splendid results for hundreds of the largest buyers of advertising in the country

These black-and-white illustrations give you but a faint idea of the attractiveness of the original colored cards. They command attention, arouse interest and prepare the mind of the recipient for your advertising messages. They are more effective than other forms of advertising for **they never reach the waste basket.** Almost anything may be successfully advertised by means of CHILTON COLORED POST CARDS. Send us your printed matter and allow us to submit suggestions absolutely without charge to you.

CHILTON COMPANY, Market and 49th Sts., Phila.



REAL TRUCK SERVICE



You judge of the value of an article to you by the experience of others in your line of business, and by the results which they have obtained by its use.

Conclusions are based upon the word of the man who has tried the particular article and who knows.

We have a lot of letters on file where Gramm owners have gone on record regarding the service the trucks have given them, which we would be glad to show you.

Many of these Gramm owners have backed up their letters by placing repeat orders—no stronger proof of their sincerity could be asked.

Among these letters you will find some that will show what others in your line have accomplished, and the results can be applied to your case as well as to theirs.

Write us, tell us of the conditions in your particular case, and we will show you how we can help you and save you money.

The Gramm Motor Truck Company

129 South Lima Street

LIMA, OHIO, U. S. A.

Exclusive Motor Truck Builders

STEEL BALLS

¶ We are importing German Chrome STEEL BALLS of superior quality and extreme accuracy in size and sphericity, such as are used in

F & S
Annular Ball Bearings

Sizes from 1-16 to 4 inch
Calibrated to .0001 inch

Correspondence is invited

J. S. BRETZ COMPANY
250 West 54th St. New York

MERCURY TRUCKS
1000 lbs. Capacity

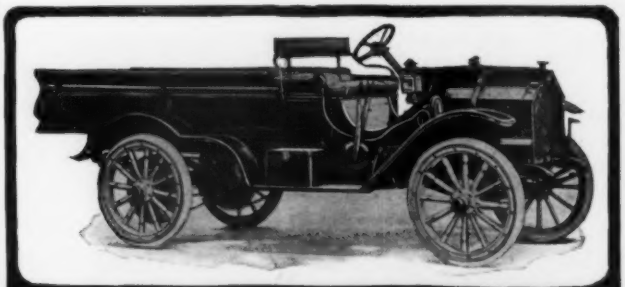
The result of 10 years' experience proves it not an experiment.

You may as well buy now.

Our product is standard, changes are unnecessary, and there will be no yearly models.

Manufacturers not assemblers.

The Mercury Manufacturing Company
4106 S. Halsted Street, Chicago, Illinois



THE LAMBERT MOTOR TRUCK

The first investment is not the most important consideration in the purchase of a motor truck. It is important that you study the construction—what will it cost you in time and money to get like results from different types of cars?

The Lambert Patented Friction Drive will give you more service at less expense than any truck built. This is apparent by studying the illustrations in this advertisement. That on the left shows the usual form of power transmission. That on the right the **Lambert Patented Friction Drive.** Six expensive complicated units, as compared to two simple components. Granted that the results from the gear transmission are equal to the friction, which is the more economical? The cost of lubricating oil alone in the one on the left, will amount to more than the replacement of parts on the **Lambert Friction Drive.**

The Lambert is trouble proof, and cannot be damaged by carelessness or inexperience. It overcomes the chief objection to commercial cars.

We have prepared some very interesting literature for you. A card brings it to you.

The Buckeye Manufacturing Co.
146 Columbus Avenue
ANDERSON, INDIANA

As pioneers, we are able to supply any size or type for your purpose

Atterbury Trucks

THE TRUCKS THAT DELIVER THE GOODS!

We carry a complete and satisfactory line. Write for details.

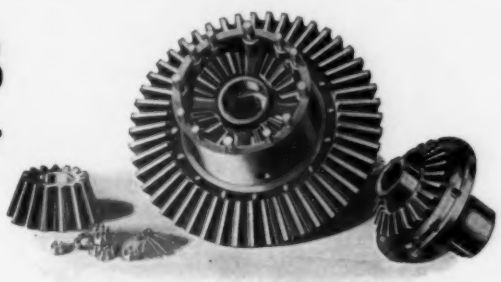
Atterbury Motor Car Co.

BUFFALO, N. Y.

ATTERBURY TRUCKS DELIVER THE GOODS

The ROSS Differential Gear

For Commercial Trucks



Made in three sizes—for trucks of from one to five tons capacity.

Write for Blue Prints

ROSS GEAR & TOOL CO. ∴ 959 Main Street, Lafayette, Ind.

SEAMLESS

MOTOR TRUCK GASOLINE TANKS

LEAKLESS

STRONG AND STURDY FOR ROUGH SERVICE
ALL SIZES IN STOCK

AIR PRESSURE RESERVOIRS FOR SELF-STARTERS AND GARAGE TIRE FILLERS

New Catalogue Now Ready—Write Us

COMPRESSED AIR MOTOR TRUCK STARTERS COMPLETE

THE W. F. STEWART CO.

ESTABLISHED 1881 INCORPORATED 1898

FLINT, MICHIGAN

We build **BODIES** for both pleasure and commercial vehicles, and can give you goods and service that can be depended on. The price, too, will be right. Get in touch with us.

Grand Rapids Motor Truck Co.

MANUFACTURERS OF THE

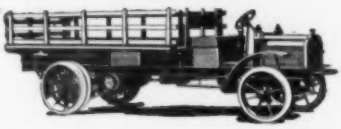
"DECATUR" HOOSIER LIMITED 1½ TON TRUCK

Formerly made by the DECATUR MOTOR CAR COMPANY, DECATUR, INDIANA

Some choice territory still open. Address

GRAND RAPIDS MOTOR TRUCK CO.
North St., Grand Rapids, Mich.

WHITE *Motor* TRUCKS



WHITE Motor Trucks are used by the leading mercantile and manufacturing firms throughout the country, in more than one hundred and fifty different lines of service.

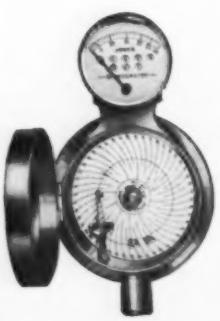
White Trucks are selected on account of strength and simplicity of construction, ease and economy of operation, and reliability and long life in service.

The White Company
CLEVELAND
Manufacturers of Gasoline Motor Cars, Trucks, and Taxicabs

THE JONES RECORDER For DELIVERY ECONOMY

The Jones Recorder is one of the profit-making parts of the commercial truck. It gives complete daily record (in chart form) of trips, stops, duration of stops, duration of runs, etc., together with the speed. It enables you to check every movement of your delivery wagons or trucks. It gives you accurate cost of maintenance.

A VERY ECONOMICAL DEVICE FOR ALL TRUCKS



The Jones Recorder consists of a strong brass casing, containing a clockwork and flexible shaft from the drive wheel of the vehicle.

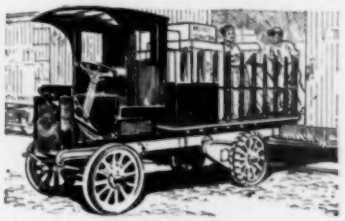
Ask for particulars

THE JONES RECORDER
Broadway and 76th St.
New York City

Ford
THE UNIVERSAL CAR

At 6's and 7's the world is sure to be—to him who has not learned to center his effort. We will make—and sell—seventy-five thousand Ford cars this year—because we have concentrated our energies upon the building of one—and only one—good car.

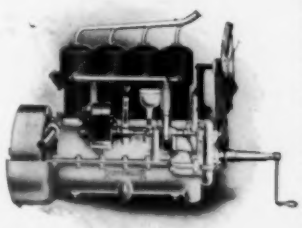
And today there is no other car like the Ford Model T. It's lightest, rightest—most economical. The two-passenger car costs but $590, f. o. b., Detroit, complete with all equipment, the five-passenger but $690. Today get Catalogue 101—from The Ford Motor Company, Detroit, Mich.



Truck Satisfaction

depends upon the performance of the motor. For heavy traffic or light, high speed or low,

THE RUTENBER MOTOR



is the most dependable. Simple in construction, silent, powerful and speedy, the RUTENBER is the most economical and efficient engine for commercial cars. It is found in half a dozen of the best trucks on the market today. It should be in yours. Write for booklet.

The Western Motor Co., Marion, Ind.

SPLITDORF MAGNETO

"Always There"

With the installation of SPLITDORF IGNITION—SPLITDORF SERVICE is at your command.

And SPLITDORF SERVICE is courteous and thorough and practical—from the factory and main distributing center in New York, through every branch office and other selling artery all over the country, to the crowning detail of personal road men.

And these road men—experts in their calling and human in their intelligence—have one duty to perform and that duty is to give their services to every SPLITDORF user for the asking.

If there is any "kink" in your ignition system—if it is not "right up to the mark" let SPLITDORF SERVICE straighten it out for you.

Your satisfaction is our satisfaction so don't be afraid to call upon us.

Write for catalog

C. F. SPLITDORF

Walton Ave. and 138th St.

Branch, 1679 Broadway, NEW YORK

CHICAGO DETROIT BOSTON KANSAS CITY LOS ANGELES SAN FRANCISCO

"Reliable Springs are More important on Commercial Cars than on Pleasure Cars."

THE PERFECTION SPRING CO.

Cleveland - - - - - Ohio

SAVE THE SPRINGS

Stops Spring Breakage and makes it possible to keep truck on the road instead of being laid up in the repair shop for the replacement of springs. **Saves Time and Expense**

Send for catalogue

GABRIEL HORN MFG. CO.

1436 East 40th St., CLEVELAND, OHIO

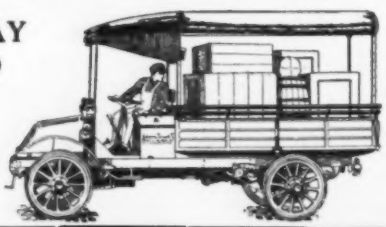
Adams Trucks
"Deliver the Goods"

ON THE ADAMS TRUCK you can build a big business. It is so simple, so substantial, so well constructed, that it gives real service. The engine parts are easily accessible without stooping. A liberal overload is provided for. The price is right. Altogether it is a very interesting proposition. We still have some good unoccupied territory.

Write for catalogue and agency proposition.

The Adams Bros. Co.

FINDLAY OHIO



MAIS
Motor Trucks

In every respect our Mais internal gear drive is superior to chains. We guarantee these gears for one million miles.

What decides the *best* truck? The record of the Mais answers—the most mileage at the lowest cost per ton-mile. All other claims are but noise that is empty compared to the sound facts that give the Mais the verdict of *best*.

Not in the gears alone, but in every feature this nickel steel Mais is the best. It is the product of international experience—it is not a "warmed over" pleasure car.

We could build chain-driven trucks, but we won't. Chains are deficient and antique. Chains lose power, sag, get dirty, break, get out of alignment, and cannot be lubricated. The best European truck builders discarded chains long ago.

We use internal gears on the Mais. They *conserve power*, are enclosed in dust and grit-proof oil-tight construction, and never need replacement.

For Catalog and data on the Mais, write

Dealers' Dept. THE MAIS MOTOR TRUCK CO. Indianapolis Ind.

50% of all AUTOMOBILE TROUBLE

is due to faulty DESIGN, CONSTRUCTION and operation of the CLUTCH

A SURE CURE

for this trouble is the

"EVANS" MODEL-"HELE-SHAW" CLUTCH

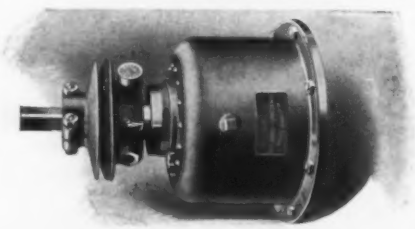
Multiple Disc—Pressed Steel Case

FAULTLESS

IN OPERATION, THEORY, PRACTICE

Greatest Frictional Area **Softest Pedal Control**

Is more Fool Proof, Accessible, Everlasting than any other Clutch obtainable



The World's Standard—on 100,000 Automobiles

Write us fully about your problem

MERCHANT & EVANS COMPANY
PHILADELPHIA
New York Chicago Brooklyn Kansas City Baltimore Denver

DREADNAUGHT, Model A-6. Capacity, 6 Tons

A Pleasure Car

does not necessarily have to be a passenger carrying automobile. A commercial car that is built right and will run 365 days in the year if necessary is a pleasure car.

B-O-E
Best On Earth

is a commercial car that is designed and constructed for strenuous service. It does work like a pleasure automobile but it isn't built along these lines. Its designers appreciated that a commercial car has to do real work day in and day out.
Note that practically all the weight is carried between the axles and that the construction represents maximum strength.

Made in 2, 3, 5, 6, 7 and 10 Ton sizes

For further particulars, write

MOTOR CONVEYANCE COMPANY
Milwaukee, Wisconsin

COVERT Transmissions and Jackshafts

Hard service has proven conclusively that the Covert Transmissions and Jackshafts have the staunch qualities and great efficiency demanded in truck work.

They are made for trucks ranging one-half to three tons capacity. An overload factor of 50% is guaranteed beyond any rated capacity.

Submit your transmission problems to us. Our Engineering Department is at your service.

Covert Motor Vehicle Co.

Sales Offices
Ford Bldg., Detroit, Mich.

Factory
Lockport, N. Y.

Gaylor — Atlas
Grips for Solid Tires

ARE

Efficient in Service
Easily and quickly attached
Simple in construction
Self-adjusting to rims
Harmless to tires
Made of Chrome Vanadium Steel
Extremely durable
Guaranteed against defects
For single and dual type tires
Needed all the year round
Inexpensive

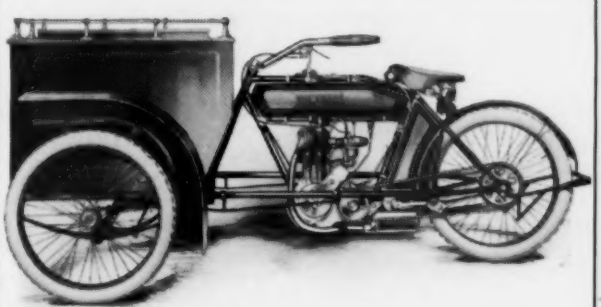
ARE NOT

Heavy and Cumbersome
Noisy
Complicated in construction
For Winter Use only
Hard to attach

A Set in the tool box guarantees your delivery service.

Catalogue on request

Atlas Chain Co.
Bush Terminal No. 4
BROOKLYN, N. Y.



Minneapolis Light Delivery Cars

Solves Your Light Delivery Problems

Quick Reliable Efficient

Capacity 300 pounds. Three point suspension unit power plant, 5 H. P. motor, two speed transmission, multiple disc clutch and free engine. Clutch control on handle bar. Simple to operate, and built to give satisfactory service to owners at an expense of ***one cent per mile.*** Motor can be started while machine is standing. Handles the same as an automobile. Initial cost and upkeep small. Catalog and literature on request. Our traffic department will analyze your delivery problem for you without obligation. Correspondence solicited with dealers in unoccupied territory.

PRICE $375

The MINNEAPOLIS MOTORCYCLE CO., Inc.
Manufacturers
517 South Seventh Street, Minneapolis, Minn.

HAYES
HEAVY TRUCK AND PLEASURE CAR
WHEELS

Strongest, Most Economical and Safest Wheels Obtainable.

After years of experimenting with all sorts of wheels, the most prominent pleasure and commercial car manufacturers in the Automobile industry now specify HAYES WHEELS on their models. They have found that these wheels meet every requirement necessary in perfect wheel construction and that it is impossible to obtain a better wheel than a HAYES at any price.

A wheel that is the undivided choice of the majority of important manufacturers is worthy of your consideration.

A trial will convince you that our statements are true.

You cannot afford to use a wheel you know nothing about—the experience will prove disastrous as well as expensive.

We have been making wheels for 25 years and if you appreciate quality and a reputation for square dealing, we solicit your wheel business.

Our facilities are unequalled, enabling us to meet every requirement with little delay.

No order too small. None too large.

All orders receive our very best expert attention.

May we be favored with your wheel business for 1912?

Consult us on your design. Our Engineering force is at your disposal.

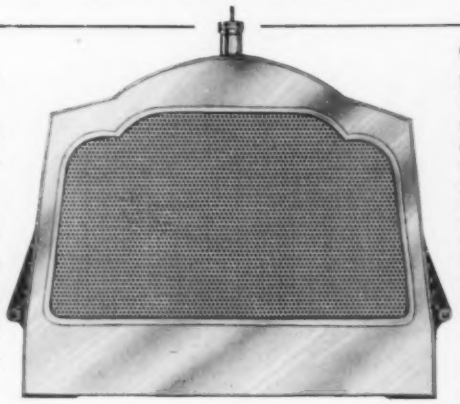
Estimates and details gladly furnished on request.

HAYES WHEEL COMPANY
JACKSON, MICHIGAN

FEDDERS

Real Square Tube Radiators

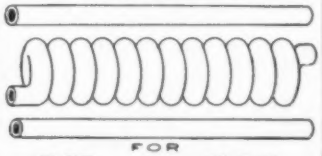
¶ Commercial cars require radiators that will stand many shocks and much hard usage. This was one of the weak parts of the commercial car but the test of time has proved that FEDDERS radiators render efficient service.



¶ We want to figure with you your requirements for the coming season. If you haven't used Fedders radiators you probably have had a great deal of radiator trouble and you may think that their isn't a radiator built that will give you satisfaction. If this is the case we would like to have an opportunity of demonstrating that the Fedders radiator will stand the wear and tear and shocks of the commercial car and that manufacturers who equip their commercial cars with the Fedders have practically no radiator trouble. We can convince you. Will you give us the opportunity ?

FEDDERS MFG. WORKS
BUFFALO :: NEW YORK

SEAMLESS
BRASS AND COPPER
TUBING



FOR
OIL AND GAS
PIPES

THE BUFFALO TUBE CO.

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Quality **Price**

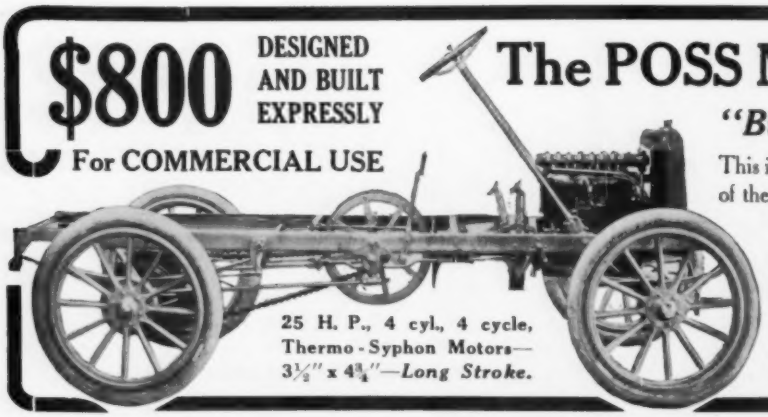
Delivery

Best in the Business

$800 DESIGNED AND BUILT EXPRESSLY For COMMERCIAL USE

The POSS MOTOR WAGON

"Built for THE PURPOSE"



25 H. P., 4 cyl., 4 cycle, Thermo-Syphon Motors—3½" x 4¾"—*Long Stroke.*

This is the secret of the Power, Strength and Durability of the Engine and Chassis of the Poss Motor Wagon. It is not a converted pleasure car. It has not a pleasure car engine. It has not a pleasure car transmission. It is a Power Wagon, with Power.

Wide-Awake, Hustling Agents Wanted
Send for our Proposition To-day

THE POSS MOTOR CO., 506 Howard Street Detroit, Mich, U. S. A.

BUCKEYE Motor Truck Jacks

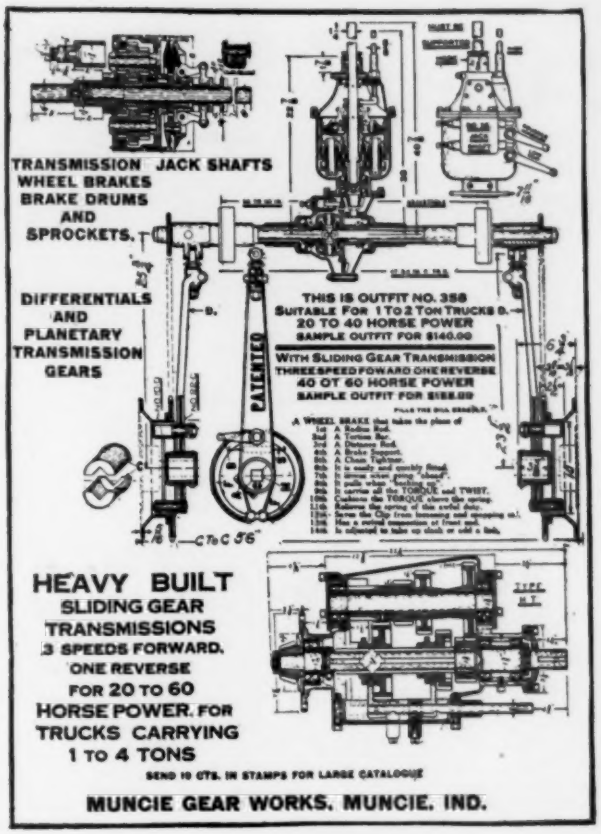
Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¼"	6½"	18"	16 lbs.	2½ tons	with formed handle	$10.00
13	14¼"	7½"	20⅞"	26½ "	3 "		15.00
14	14¼"	7½"	20⅞"	33 "	5 "		16.00
9	11½"	6"	17½"	10 "	1½ "		6.00

Write today for descriptive catalog. Made only by

THE BUCKEYE JACK MFG. CO., Alliance, Ohio



HEAVY BUILT SLIDING GEAR TRANSMISSIONS 3 SPEEDS FORWARD, ONE REVERSE FOR 20 TO 60 HORSE POWER, FOR TRUCKS CARRYING 1 TO 4 TONS

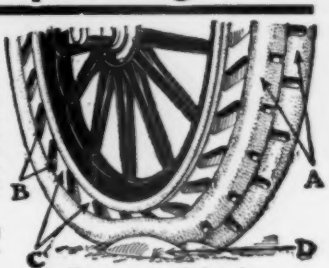
SEND 10 CTS. IN STAMPS FOR LARGE CATALOGUE

MUNCIE GEAR WORKS, MUNCIE, IND.

Give Lowest Operating Cost

Motz Cushion Tires will not only give the mechanical parts of your car the same protection as pneumatics, **but will greatly reduce your per-mile fuel expense.** So conclusively has this been proven that twenty-two out of a possible twenty-five Electric Pleasure Car builders, as well as nine builders of high-grade Commercial cars, are using Motz Tires.

And with these tires you will never be bothered by costly punctures, rim cuts or dangerous skidding. And you'll have tires guaranteed for 10,000 miles—two years.



A—Shows *double*, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.

Motz Cushion Tires

are as easy-riding as any properly-inflated pneumatic tire. Note their construction, their double, notched treads, which prevent skidding and distribute the weight to the sides. The undercut sides allow free action of the bridges. The slantwise, elastic bridges give and yield like the air in a pneumatic tire.

They fit any standard clincher, universal quick-detachable or demountable rim.

Where speed and not carrying capacity is the big factor, Motz Cushion Tires should be used.

For heavy duty trucks, where load, not speed, is the principal factor, we recommend Motz Solid Tires on DEMOUNTABLE Rims.

Write for booklet 85. Please mention make and model of your car.

THE MOTZ TIRE & RUBBER CO.
Factories and Executive Offices:
AKRON, OHIO

Branches:—1737 Broadway, New York; 2023 Michigan Ave., Chicago; 999 Woodward Ave., Detroit; 409 E. 15th St., Kansas City; Standard Tire & Rubber Co., 104-106 Portland St., Boston, Mass. Distributors for the New England States.

SCHWARZ

MANY TYPES BUT ONLY ONE GRADE!

The SCHWARZ WHEEL IS MADE TO meet every requirement of every type of every motor vehicle, and regardless of the style it is always of one quality,—the very best.

The automobile manufacturer has learned that if he wants to sell his cars without making any excuses for the wheels that he can answer every question satisfactorily in one word,—SCHWARZ!!

Why experiment? The reputation of the Schwarz Wheel is established. It is used on all leading Motor Trucks.

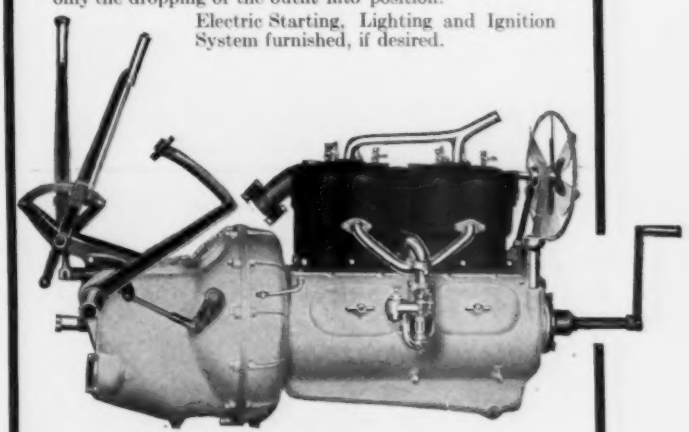
SCHWARZ WHEEL COMPANY
FRANKFORD, PHILADELPHIA, PA.

THE HAZARD UNIT POWER PLANT

Can be Mounted in Practically Any Truck

All parts of the Power Unit are integral, necessitating only the dropping of the outfit into position.

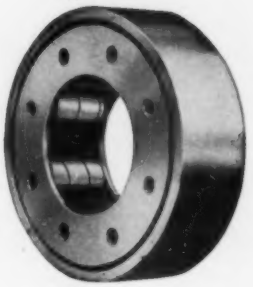
Electric Starting, Lighting and Ignition System furnished, if desired.



No Time Limit to Our Guarantee
Full Descriptive Catalog on Request

HAZARD MOTOR MFG. CO.
844 Coates Street, ROCHESTER, N. Y

HYATT HIGH DUTY TYPE



ROLLER BEARINGS are made from an alloy steel with a very high elastic limit, making them capable of meeting severe conditions better than any other bearing.

HYATT ROLLER BEARING COMPANY
DETROIT, MICHIGAN

AUTOMOBILE TUBING

Seamless Brass and Copper Tubing

of all kinds,—any size, any gauge, any temper
From ½″ down to the finest.

We are supplying many of the largest and best automobile concerns in the country with tubing. Why not let us quote you on your requirements? Our **QUALITY** is guaranteed,—our prices are low as quality will allow, and prompt deliveries are guaranteed. Could you possibly ask for more? **Correspondence solicited.**

ROME HOLLOW WIRE & TUBE COMPANY - Rome, New York

Seamless, Cold Drawn Steel Tanks

FOR

Air, Gas, Gasoline, Oil, Etc.

High or Low Pressure

BRAKE DRUMS AND AUTO BOILER SHELLS

FEDERAL PRESSED STEEL CO., Milwaukee, Wisconsin

THE KINSEY MANUFACTURING CO.

TOLEDO, OHIO

Manufacturers of Auto Parts—

Kinwood Radiators, Fenders
Kinwood Oilers, Gaskets
Kinwood Steel Frames, etc., etc.

SPECIAL METAL STAMPINGS

Price, $1675, complete.
1500 lbs. capacity

Note these Selling Points on the LIPPARD-STEWART

In this and subsequent advertisements, we shall give some of the selling points about the Lippard-Stewart delivery car—features that make this car a good buy for the customer—and a good selling proposition for the dealer.

I. Small Motor. We use a small motor, 22 h. p., and get our weight-moving ability by means of a large gear reduction (5 to 1) at the rear axle. The small motor has three advantages:
(1) Consumes less gasoline and oil.
(2) Less Vibration.
(3) Speed cut down by design. Maximum speed, 25 miles per hour.

II. Unnecessary Parts Eliminated. No battery, timer, battery wires, spark coil, belt-driven fan, or other trouble-making parts.

III. Every Unit Accessible. Every part of the Lippard-Stewart delivery car is easy to get at. That means a lot—not merely in making repairs, but by preventing the necessity for repairs. And when, in case of accident, repairs are necessary, time is saved and cost reduced by the fact that every unit—motor, clutch, transmission, radiator, etc.,—is quickly removable without disturbing any other units or the load.

Write for our catalog and further information about the money-making possibilities of this splendid car.

Lippard-Stewart Motor Car Company, Buffalo, N. Y.

Motor Lauth Juergens Trucks

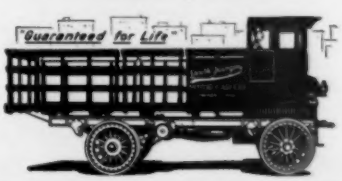
Are Guaranteed For Life

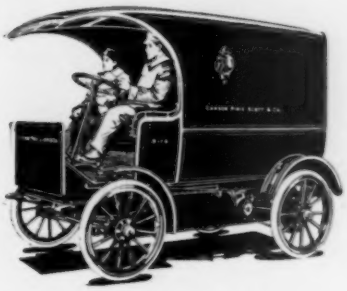
WHAT MORE CAN WE SAY?

Made in 1, 2, 3 and 5-Ton Sizes

Send for Catalogue

The Lauth-Juergens Motor Car Co.
FREMONT, OHIO





Commercial THE Detroit ELECTRIC Vehicles

Equipped with the Thomas A. Edison Nickel and Steel Battery, are the Ideal Vehicles for City Deliveries & Trucking

DETROIT Electric Commercial Vehicles are easily handled in congested traffic. As the various speeds are instantly attained by the use of one lever, it allows the driver to take immediate advantage of openings in traffic, and to start and stop quickly in tight places, at wharves, freight terminals and loading stations.

There is no fire hazard with Detroit Electrics. They are admitted to all wharves and freight terminals. All body space is available, except the driver's seat.

We claim that it is cheaper to own a Detroit Electric Commercial Vehicle than to go without it because of its economy in upkeep. The *total operating cost* is far more important than the original cost of the vehicle. Its first cost is a small feature in estimating its *actual worth* in service. A Detroit Electric Commercial Vehicle is an investment—because of its reliability, long life, reasonable first cost and, above all things, for its dependable every-day service. It's always on the job if properly cared for.

We want you to particularly bear in mind that Detroit Electric Commercial Vehicles are designed *exclusively* for the use of the Thomas A. Edison nickel and steel battery. This battery of itself is about 300 pounds lighter than a lead battery equipment, at the same time giving far greater mileage. Additional weight is saved because of the lighter construction possible throughout the car. We have only to remind you that the less weight there is to move, the cheaper the cost of power to move it.

The great, big, vital point about the Edison battery is that it is an investment, not a running expense. It is practically indestructible. There are no acids, no washing of plates, no renewals.

The Edison battery can be short-circuited, charged backward, overcharged, discharged to zero and remain standing indefinitely without injury. It will not break under violent concussion or vibrations.

Illustrated catalog sent on request.

Anderson Electric Car Company
456 Clay Avenue :: Detroit, Mich., U. S. A.

BRANCHES:—New York, Broadway at 80th Street.
Chicago, 2416 Michigan Avenue.
(Also branch at Evanston, Ill.)

Brooklyn	Cleveland	Minneapolis
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Selling representatives in most leading cities.

VANADIUM

The Anti-Fatigue Steel

Elastic Limit, 106,233 lbs. per sq. in. Elongation in 2 in., 23.8%
Tensile Strength, 123,070 lbs. per sq. in. Reduction of Area, 49.4%

Vanadium Steel is the cheapest steel because it is the strongest, toughest and most durable. It should be specified for all vital parts of engines and machinery, as its use means greatly lengthened service and freedom from repair expenses.

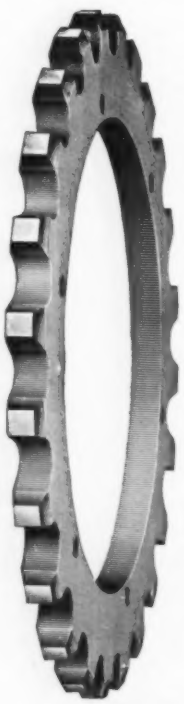
Booklets and expert advice on application.

American Vanadium Company

Manufacturers of Ferro Vanadium — Immediate shipment, any quantity

339 Frick Building, PITTSBURGH, PA.

LONDON PARIS PITTSBURGH



CULLMAN SPROCKETS and Differentials

in stock and to order.

Send for catalog and let us quote you on your requirements.

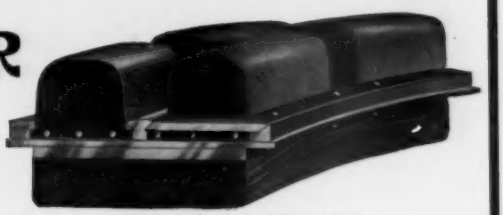
CULLMAN WHEEL COMPANY, CHICAGO

1351 GREENWOOD TERRACE

Goodyear Demountable Solid Tire—
Guaranteed 10,000 Miles.

GOODYEAR

"A Tire for Every Service"



Goodyear Individual Block Tire

Two New Goodyear Tires

We regard these two new motor truck tires as remarkable inventions.

We place them right alongside of Goodyear No-Rim-Cut Pneumatic Tires.

For they will be welcomed as much by *Motor Truck* owners as "No-Rim-Cuts" are by *pleasure car owners.*

Our Demountable Tire

Your driver can quickly replace this *demountable* tire. No more sending wheels away or even removing them. No more trucks tied up awaiting tire repairs or replacement.

And this tire has a *steel-and-hard-rubber base.* The base *can't* wear out before the tread.

In fact, a specific, 10,000-mile guaranty countersigned by the Goodyear Tire & Rubber Company goes with each set of Goodyear "Demountables."

Furnished in single or dual tread. Adapted to medium-sized or heavy trucks.

Our Individual Block Tire

Each block has its own, individual fastening—is held securely—can't work loose—can't chafe and thus wear itself out underneath.

The base always outwears the tread.

Unscrewing two nuts and lifting off the individual metal fastening loosens the block. Anyone can do it and replace the block—with wrench and clamp.

No extra tire equipment needed except a few blocks. Your truck is never laid up by tire trouble.

This tire is for heavy trucks—gives greatest traction and is non-skid.

Tires for Light Cars

For light cars we make two tires—the "Goodyear Solid No-Rim-Cut" and the "Goodyear-Motz." Each possesses amazing resiliency, is easily applied and gives maximum mileage.

Before equipping your light car, learn about these excellent tires.

Consult Our Engineers

They can tell you exactly the tire that's adapted to your truck.

State make and model of your car; the style of wheels and rims; the kind of roads over which your car is driven. Address:

The Goodyear Tire & Rubber Company, Akron, Ohio

Branches and Agencies in 103 Principal Cities. We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits

Main Canadian Office, Toronto, Can. Canadian Factory, Bowmanville, Ont.

(528)

Detroit Oilers Prevent Waste

The Detroit Mechanical Force Feed Oiler gives **sure** lubrication under every condition.

In connection with splash systems the Detroit maintains **exactly** the correct level at all times At every changing speed the right amount of fresh, clean oil is supplied as fast as the oil is used up.

With the oil level in the crank case maintained at the proper height, there is no opportunity for either under-lubrication or over-lubrication.

By preventing over-lubrication the Detroit Mechanical Force Feed Oiler eliminates **waste** of oil and its results—carbonized cylinders, pitted valves, fouled plugs and smoke at the exhaust.

Once properly regulated the Detroit Oiler takes care of itself and needs only an occasional replenishment of the oil supply in the reservoir.

The Detroit Force Feed Oiler gives a **complete** lubricating system for **every** kind of gas engine. It is efficient, economical and sure.

The Detroit Force Feed Oiler Has No Checks

The Detroit has no ball checks or check valves, springs or other complicated mechanism to get out of order and clog up. It guards against the damage, waste and expense resulting from faulty lubrication. It makes for GUARANTEED SERVICE.

Detroit Force Feed Oilers are made in capacities from two pints to five gallons, with from one to thirty feeds—pulley, ratchet, sprocket or gear drive.

They are furnished as standard equipment by many manufacturers of high-grade commercial trucks.

The Detroit catalog tells all about the advantages in design and construction which have made the "Detroit" the standard gas engine lubricator.

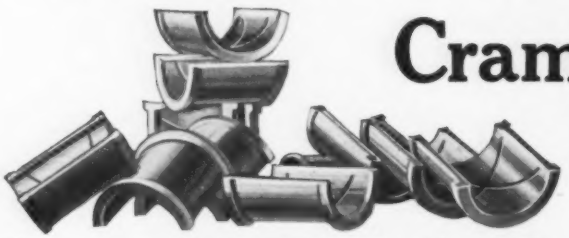
Write today for catalag P-68 and full information, stating in what kind of truck you are interested.

DETROIT LUBRICATOR COMPANY.

DETROIT, U. S. A.

Largest manufacturers of lubricating devices in the world.

Parsons' White Brass and Cramp's Special Bearing Bronze



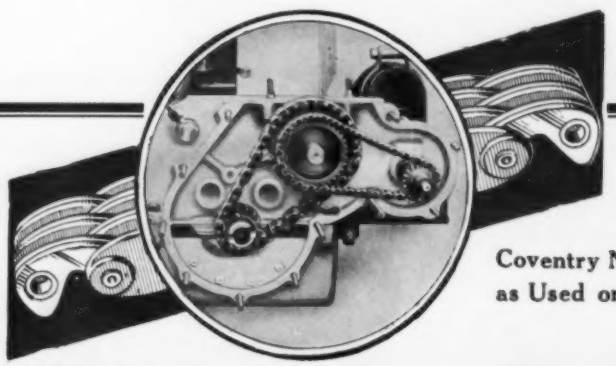
These metals are used by the following companies among many others:

AMERICAN LOCOMOTIVE CO.
PEERLESS MOTOR CAR CO.
LOCOMOBILE CO. OF AMERICA
WINTON MOTOR CARRIAGE CO.
LOZIER MOTOR CO.
PACKARD MOTOR CAR CO.
BENZ AUTO IMPORT CO. OF AMERICA
MOON MOTOR CAR CO.
OHIO MOTOR CAR CO.
E. R. THOMAS MOTOR CAR CO.
MAIS MOTOR TRUCK CO.
CHALMERS MOTOR CAR CO.
F. B. STEARNS CO.
ALDEN SAMPSON MANUFACTURING CO.
MACK BROS. MOTOR CAR CO.
VELIE MOTOR CAR CO.
NATIONAL MOTOR VEHICLE CO.
HUPP CORPORATION
DORRIS MOTOR CAR CO.
MERCER AUTOMOBILE CO.
KISSEL MOTOR CAR CO.
WOODS MOTOR VEHICLE CO.
ABBOTT MOTOR CO.
REO MOTOR CAR CO.
INTERNATIONAL HARVESTER CO.
SAURER MOTOR CO.

These manufacturers have earned a reputation for their cars only by the expenditure of thousands of dollars and long years of hard labor. They cannot afford to risk this hard-earned reputation by the use of inferior metals—injury to a few cars would destroy the reputation of their entire output.

Our guarantee of quality, uniformity and fair treatment is back of every casting sold

The William Cramp & Sons Ship & Engine Building Co.
PHILADELPHIA, PA.



Coventry Noiseless Chains
as Used on "Benz" Engines

COVENTRY
NOISELESS CHAINS

Have been the standard of Europe for many years. These chains run with remarkable accuracy and precision, their construction and design make them positive and flexible.

Standard equipment on the following cars: **Daimler, Deasy, Humber, Maudslay, Benz, Arrol-Johnson, Vauxhall, etc.** Write for full description and details,

UNITED STATES REPRESENTATIVES:

SARCO ENGINEERING CO., 110 Broad St., New York

(Full size.) Patented in America and Europe

M and M
Controller and Economizer

MR. TRUCK OWNER:—

We can decrease your expenses and increase your profits. Won't you let us prove it?

THE REASONS WHY THE M & M WILL INTEREST EVERY TRUCK OWNER:

It gives the operator instant control of car at all times.

It increases motoring comfort on rough roads and crowded streets.

It will reduce the expense of your car on brakes, batteries, spark plug coils and gasolene about 80%.

Requires no adjustment after being properly fitted on car.

M and M goes on the intake pipe, operated by foot pedal.

When your Car is equipped with M and M it uses no gasolene whatever going down grades.

What the coaster brake is to a bicycle the M and M is to the automobile.

There are many other reasons explained in our Booklet and Testimonials.

No truck or automobile complete without it. By the use of the M & M CONTROLLER AND ECONOMIZER accidents can be avoided, and your car under absolute control at all times.

Simple to attach. Any garage or machine shop can install it on short notice at trifling expense.

We will refund the price paid for the attachment, if after sixty days' trial, it don't do what we claim for it, and will also replace any part or parts that are imperfect in the workmanship or material, and will not perform the work it is made for in a satisfactory manner.

Discounts to dealers and repairmen.

Act at once! Remember, while you are thinking about giving us your order for one of these M & M Economizers you are losing money by thinking, but don't think, but give us your order at once.

Price, complete, $3.50

Agents Wanted

Moller Bros. Controller and Economizer Co.

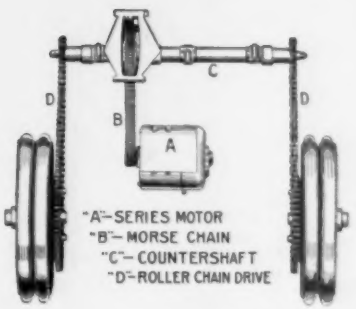
Gen. Offices, 700 Betz Bldg., Philadelphia, Pa.

If it cannot be had at your dealer's, write us at once

GENERAL VEHICLE GREATEST VALUE

G. V. Electric Trucks

SIMPLICITY : STANDARDIZATION



This is all there is to the G. V. Power Plant. Compare it with the power plant of non-electric trucks. One *rotating* part against numerous *reciprocating* parts. No gear changing—no clutches. *No small parts to wear out and break on the road.*

All of the 6 G. V. models are standardized and all parts of each model are *interchangeable* and *accessible.*

Do you wonder that the G. V. Electric has the lowest maintenance cost of any commercial vehicle made?

750 lbs., 1000 lbs., 2000 lbs., 2-tons, 3½-tons and 5-tons capacity.

Write for catalog 84 and other data

General Vehicle Company

Works and General Offices

Long Island City, New York

New York	Boston	Philadelphia	Chicago	St. Louis
505 Fifth Ave.	84 State St.	Witherspoon Bldg.	417 The Rookery	Wainwright Bldg.

A COMMERCIAL CAR IS NO BETTER THAN ITS ENGINE

THAT IS WHY WE BUILD THE ENGINE OF THE

"Little Giant"

COMMERCIAL CAR

The precision machinery used in the manufacture of Pneumatic Tools is none too good for the

Little Giant

Capacity One Ton

Eight standard types of body

The Heart of the **Little Giant** Commercial Car is its Engine.

Its Heart is right; the car is right.

Let us send you the specifications.

CHICAGO PNEUMATIC TOOL COMPANY

CHICAGO
1010 FISHER BLDG.

BRANCHES EVERYWHERE

NEW YORK
50 CHURCH ST.

ELECTRIC VEHICLES

Built at a Popular Price

Chassis
(including Seat)
$1350.00

Express
$1400.00

Panel
$1500.00

Capacity
1000 lbs.

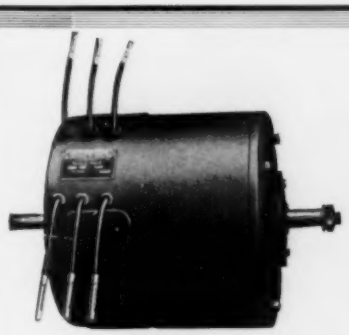
ECONOMY

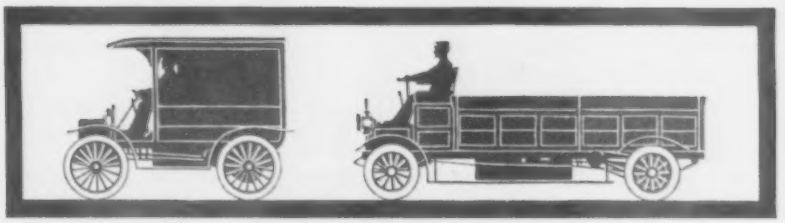
SIMPLICITY

DURABILITY

Inquiries from Users and Dealers will receive prompt and personal attention

M. & P. ELECTRIC VEHICLE CO., Franklin and Dubois Sts., Detroit, Mich.





The Serviceable Electric Delivery Truck

Has Westinghouse Vehicle-Motor Equipments

Every electric truck builder who wants his truck to gain a reputation for serviceability, should give special attention to their most vital part,—the driving equipment.

The builder who uses Westinghouse Vehicle-Motor Equipments, insures maximum service for his trucks. The motors are light, noiseless, dust and moisture proof; the controllers are extremely simple, and convenient and easy to manipulate.

Make your trucks thoroughly serviceable with Westinghouse Vehicle-Motor Equipments. Consult our nearest office.

Westinghouse Electric & Manufacturing Co.

Sales Offices in Forty-Five American Cities **East Pittsburgh, Pa.**

THE COMMERCIAL CAR JOURNAL

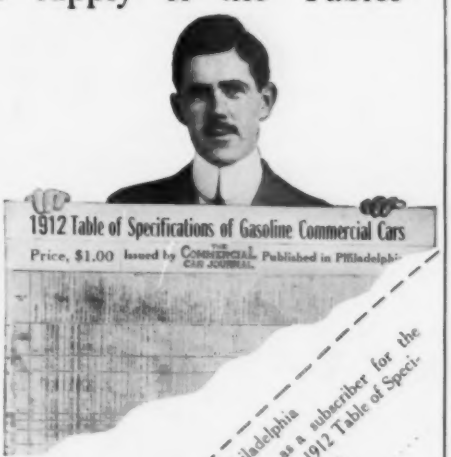
THE LARGEST AND MOST COMPREHENSIVE MAGAZINE DEVOTED TO COMMERCIAL MOTOR CARS IN THE WORLD!

is now being offered to subscribers with the 1912 Table of Specifications of Gasoline Commercial Cars for $2.00---THE REGULAR PRICE OF THE CCJ ALONE---UNTIL the supply of the Tables is EXHAUSTED.

The Specifications show at a glance every detail of over 300 models of 1912 Commercial Cars. It is an invaluable reference for everyone interested in any way in commercial motor cars.

The CCJ each month contains illustrated descriptions of two or more of the cars listed on the Table of Specifications and explains the class of work for which they are best adapted, as well as how to use them efficiently and economically.

Only by ordering the CCJ at once can a subscriber be sure of getting the Specification Table.


1912 Table of Specifications of Gasoline Commercial Cars
Price, $1.00 Issued by THE COMMERCIAL CAR JOURNAL Published in Philadelphia

SEND THE COUPON WITH $2.00

CHILTON COMPANY, *Publishers*
Market and Forty-Ninth Streets, Philadelphia

CHILTON COMPANY, Philadelphia
For enclosed $2.00 enter me as a subscriber for the CCJ for one year; also send 1912 Table of Specifications of Commercial Cars.
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How to Cut Down Maintenance Costs of Your Motor Trucks

IN no class of motor vehicles are bearings of greater importance than in Commercial Trucks. Maintenance costs must be figured down to the last penny. The highest standard of efficiency must be attained—and *maintained*.

For these reasons the careful investigation of **NON-GRAN** High Speed Bearing Bronze is of the utmost importance to Owners and to Manufacturers of all Motor Trucks.

To Motor Truck Owners

Granular minor shaft bearings are responsible for a heavy percentage of avoidable motor troubles. **NON GRAN** will not metallize the oil. It makes your truck run better, easier, longer, and far more economically.

In buying a Motor Vehicle for your business, or in having your present Truck overhauled, specify **NON-GRAN** High Speed Bearing Bronze—and lengthen the life of your car.

To Motor Truck Manufacturers

The reputation of your cars depends upon their ability to stand up under the severest tests of daily usage. You know the important part bearings play in the service your cars will give.

Loose-knit granular bearings affect the very life of your motors. **NON-GRAN** will make your cars stand up three or four times as long as ordinary bearings that flake off and metallize the oil.

You are spending money to make your cars give honest service. **NON-GRAN** insures greater efficiency and hence greater sales for your cars.

You Will Both Be Interested in this Free Illustrated Booklet—

Whether you are a merchant or manufacturer, and use Commercial Cars in your business, or whether you build Motor Trucks—it will pay you to write today for our interesting illustrated booklet, fully describing the increased efficiency **NON-GRAN** means to you. Write for it **now.**

AMERICAN BRONZE COMPANY

483-495 Berwyn Avenue **Berwyn, Pennsylvania**

HIGH SPEED NON-GRAN BEARING BRONZE

BANDS
and
FLANGES
for
MOTOR TRUCKS

PERFECT WORKMANSHIP
EXCELLENT MATERIAL
PROMPT DELIVERIES

THE STANDARD WELDING COMPANY
CLEVELAND

NEW YORK CHICAGO DETROIT

JARVIS HUNTINGTON
COMMERCIAL TRUCKS

5 TON TRUCK — $4400

Not alone up-to-date ***Actually ahead of date***

3 MODELS

2 Ton, $2750 **3½ Ton, $3500** **5 Ton, $4400**

The following features guarantee unsurpassed performance:

Motor: After a three year test in the factory and in the mountains of West Virginia, we have the most economical and sturdy power plant in the market. Bore 4", Stroke 6". 4 cylinders cast separately, 4 cycle, Valves in the head with overhead cams.

Hele Shaw Clutch, the best in the world. Our own transmission Chrome Vanadium gears hardened by special process. 3 speeds forward, one reverse. A brake system that positively will stop the truck within its own length going at a maximum speed. Inspection of all material and of all parts carried to the limit of carefulness.

A guarantee of 10,000 miles' service — no frills about it.

Complete equipment, electric light, electric horn, hub mileage recorder, Reliable self-starter, tools and a liberal supply of spare parts.

We want the active co-operation of live dealers. We have an extremely attractive agency proposition. Let's hear from you. Now is the time to act. Output for 1912 limited to 100 trucks, but each and every one of them built by experts under supervision of men who for nearly 40 years have built engines and locomotives.

A postcard will bring you our catalog

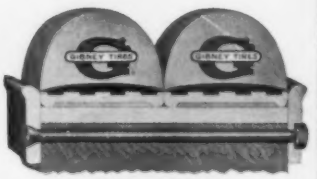
JARVIS HUNTINGTON AUTOMOBILE CO.
HUNTINGTON, W. VA.

A good way to keep ahead is to start ahead.
The Gibney type of tire is three years ahead. The verdict of users has caused tire manufacturers to recognize its superiority, and the Gibney type is being universally copied in 1912. J. L. G. & Bro 4/1/12

Gibney Single

GIBNEY

The Three-Years-Ahead Tire



Gibney Dual

THE three years' start we have had means three years of experience, which in turn means a superior product and therefore better value for the buyer. This certainly means something to you.

There probably is no product that will go wrong quicker than tires, if the man making them has not had experience. Theories as applied to tires are costly. Experience is a dear—but good—teacher. You get the benefit of our experience, consequently you run no risk.

What the other fellow says ought to interest you. He has paid for his knowledge and his endorsement is impartial:

Extract from letter dated Nov. 10, 1911:

" . . . . To date we have used a number of tires made by you on our heavy electric trucks in our delivery service. We have always found these eminently satisfactory in every respect, and they were good for the time guaranteed. . . . . They never failed us under the most adverse conditions of heavy loads and bad streets. Our tire expense has been materially reduced since using your tires and efficiency greatly increased."

(Signed)

AMERICAN BREWING CO., Philadelphia.

WE are quite proud of the fact that users of **Gibney Tires** write us enthusiastic letters, and while we reproduce but one in each advertisement, we would be pleased to send you copies of many. We feel that the buyer's good will is the seller's good fortune, and that is why we have always tried to make **Gibney Tires** so good that every one would be an asset which we could place in our good-will column. We sell service and show that in mileage **Gibney Tires** average better than others. We would be pleased to have you tell us your requirements, so that we may give you quotations.

JAMES L. GIBNEY & BRO.

213 N. Broad Street, Philadelphia **248-52 W. 54th Street, New York**

LINCOLN MOTOR WAGONS

Rank First Among All Light Delivery Cars

NO TIME LIMIT ON THE GUARANTEE

Such a Guarantee inspires confidence.
Built with a thorough knowledge of light motor wagon requirements.

Strong construction **Reliable service**
Small upkeep cost **Large tires**

$575.00 to $785.00

500 Pounds to 800 Pounds Capacity

Open or panel top bodies. Solid or pneumatic tires.
We want good agents in open territory. Write for terms.

Lincoln Motor Car Works

1343 W. Harrison St., Chicago, Ill.

KOEHLER

COMMERCIAL CAR

The MAXIMUM and MINIMUM CAR

(MAXIMUM LOAD CAPACITY FOR MINIMUM LIST PRICE)

OPEN FLARE-BOARD TYPE

Large and Roomy—inside measurements 44 inches wide, 84 inches back of driver's seat to rear. Flare-boards, 17 inches above floor. Strongly ironed throughout, also ironed to receive four-post canvas top, which can be had from stock at $25 additional. Suitable for general express work.

Carrying Capacity, 1600 lbs.

Price, $750

With Various Types of Bodies; the Prices Range From $750 to $900.

THE KOEHLER COMMERCIAL CAR is first of all a **business** wagon, from the ground up. It is not an adaptation of the pleasure type of vehicle, with its annoyance and expense, like many so-called commercial cars, but has been especially designed for heavy duty 300 days in the year—and nights, too, if necessary.

When we tell you that the KOEHLER is designed, developed and built by Mr. L. E. Schlotterback, we give you a positive guarantee of its efficiency, for Mr. Schlotterback is acknowledged to be an expert designer of commercial cars, second to none—in fact—in America. He has designed every type of commercial car from ten-ton capacity downward. His business life has been devoted to the solving of transportation problems, and there isn't much about trucks that he doesn't know.

All of this long experience, engineering ability and practical knowledge has taken concrete form in the **Koehler Commercial Car of 1600-pound capacity,** exhaustive tests having proven that this is the most economical load to carry in order to obtain the right speed and the right haul at the right price per load.

Why the Koehler Commercial Car is of 1600 lb. capacity

Mr. Schlotterback, realizing the need of merchants—big and little—everywhere for a satisfactory delivery car, decided to specialize first—on a size that would be most economical; second—on a design best adapted to that size; and third—on a car that anybody could use and drive, with a carrying capacity which would recommend it to anybody who faces the delivery problem in business. Result—the **Koehler Commercial Car.**

Exhaustive investigations and tests were necessary. Mr. Schlotterback successfully determined the REAL COST of transporting merchandise in single heavy loads under every conceivable condition. He found out which was the most reasonable method—whether merchandise should be delivered by a heavy truck to a given point and then reloaded on smaller trucks to be sent to its final destination, making two hauls—or whether it was more advantageous, i. e.—economical, to use a number of small trucks to accomplish the same result.

His investigations proved conclusively that the **cheapest, best and quickest method was the smaller delivery wagon.** He found that it moved quicker, and did just as much work at DECIDEDLY LOWER COST.

The next problem was—capacity. What load would further minimize transportation charge. Mr. Schlotterback made test after test. He tried out the 500-pound load, the 800-pound, the 1500 and 2000-pound capacity. He studied the figures and particularly the cost, carefully, and decided that the small car of 1600-pounds capacity was the logical car needed for the economical carrying of a load, regardless of business demands.

That's why the Koehler Commercial Car is of 1600 lb. capacity

Address all correspondence to

H. J. KOEHLER S. G. Co.

Sole Distributers for the Entire Output

1709 Broadway, New York, N. Y.

FACTORY:—Newark, New Jersey

Address all communications to the

New York Office, 1709 Broadway

KOEHLER

COMMERCIAL CAR

The MAXIMUM and MINIMUM CAR

(MAXIMUM LOAD CAPACITY FOR MINIMUM LIST PRICE)

Specifications

Motor—2 cylinder opposed, 22-24 H. P.
Cooling—Thermo-syphon system.
Ignition—Bosch High-tension Magneto.
Control—Left hand, throttle lever on steering column.
Drive—Direct line with jack shaft. Final drive from jack shaft to rear wheel sprockets through double side chains.
Transmission—Planetary type. All gears genuine chrome nickel steel, hardened throughout.
Brakes—Service brakes on jack shaft. Emergency brakes simple in design, extraordinarily powerful, operated independently.
Tires—2 inch Solid Rubber.
Capacity—1600 pounds.
Wheel Base—85 inches.
Speed—4 to 16 miles per hour.
Price—$750 to $900, depending on body equipment.

PANEL TYPE B, $900

Inside measurements 42 inches wide, 53 inches from floor to top, 84 inches back of driver's seat to rear.

Canvas side body similar in appearance to Panel type B—$775

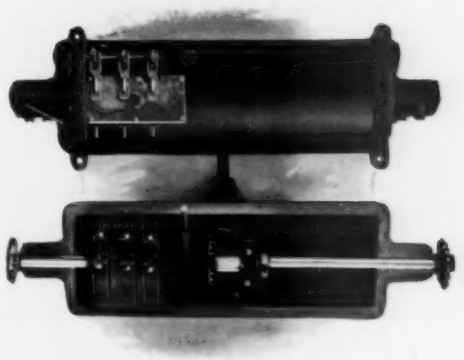
Having demonstrated the practicability and economy of the 1600-pound car, Mr. Schlotterback turned his attention to the **construction** of this ideal commercial car—a car which will revolutionize the transportation of merchandise. His long experience in building motor trucks enables him to build the KOEHLER COMMERCIAL CAR at minimum cost, which easily makes possible the **best car for the least money,** commensurate with stability, capacity and real economy.

THAT'S WHY WE ARE ABLE TO SELL THE KOEHLER COMMERCIAL CAR AT $750 TO $900.

Don't confuse the KOEHLER COMMERCIAL CAR with the ordinary light delivery car.

Remember that it is specially designed to take the place of the one and two-horse vehicle and is so simple in operation that the drivers of horse-drawn vehicles can successfully operate it.

OIL TIGHT CASE



In which transmission bevel gears and metal to metal clutch run in a CONSTANT OIL BATH.

WE ARE READY To assign territory to progressive dealers—dealers who are alive to the opportunity offered in handling a car that offers the best inducement to the prospective user—economy of operation—lowest first cost and lowest upkeep.

FACTORY:—Newark, New Jersey

Address all communications to the

New York Office, 1709 Broadway

Address all correspondence to

H. J. KOEHLER S. G. Co.

Sole Distributers for the Entire Output

1709 Broadway, New York, N. Y.

The HESS-BRIGHT Catalog

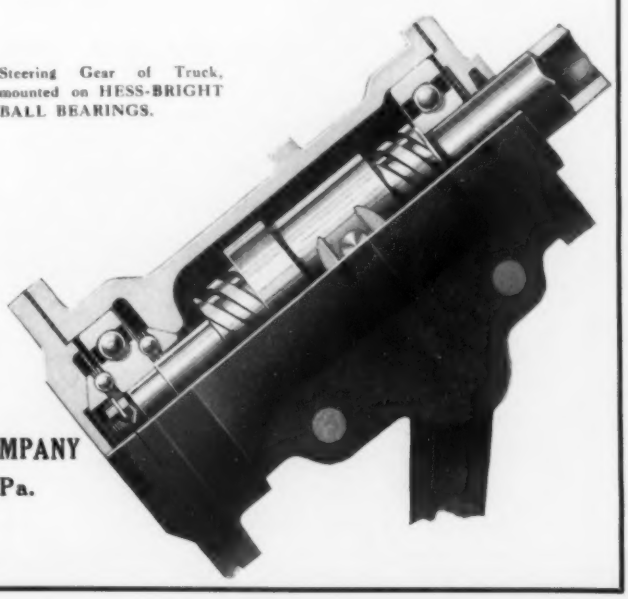
gives engineering information of interest and value to every designer of motor vehicles.

It describes fully the technical features requisite to durability in anti-friction bearings. The failure of early adjustable types of ball bearings, and the wonderful success of the modern annular type, are referred to their scientific reasons and clearly explained. Certain advantages of the Hess-Bright design are likewise mentioned.

The catalog is replete with illustrations showing ball bearing development. The method employed by the Hess-Bright (DWF) factory to secure exact uniformity of size and hardness are described and the testing apparatus illustrated. Interesting microphotographs are shown of ball surfaces and fractures—Hess-Bright and others.

Selected photographs give an idea of the size and organization of the enormous DWF plant, with its capacity of over 8000 complete bearings daily; and a short but significant chapter is devoted to the fast-growing range of applications in general machinery to which HB-DWF bearings have been put.

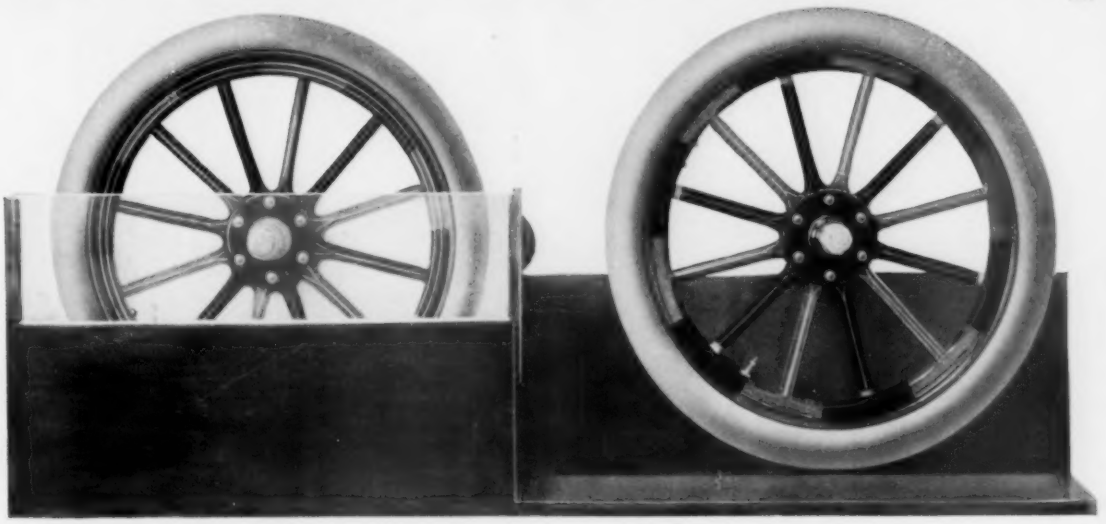
The catalog is handsomely engraved and printed by the Bartlett-Orr Press, and is a work of art as well as of reference. We will send it free to any motor vehicle designer on request. Write on the stationery of your company.



Steering Gear of Truck, mounted on HESS-BRIGHT BALL BEARINGS.

THE HESS-BRIGHT MANUFACTURING COMPANY
2128 Fairmount Ave., Philadelphia, Pa.

The Varnish That Defies Soap



A startling demonstration of a Varnish absolutely unharmed by the caustic action of automobile soap—a feature of our exhibit at the automobile shows this year

Very likely you have seen the wheel revolving in the soapy water at our booth and have noted that the finish on half the spokes remained in perfect condition, while that on the remaining spokes lost its lustre before your eyes.

Six of the spokes of the wheel are finished with the best automobile gear varnishes heretofore made. They cannot withstand soap. The other six spokes are finished with

Valentine's Vanadium Chassis Finishing

These spokes stand up absolutely unharmed after weeks of exposure to soap and water.

Every automobile manufacturer, every dealer, every owner knows, after sad experience, that there has been no finish until now that has not been literally eaten up by soap. The condition of the hood, fenders and all the underparts of every automobile, after a few months of use is testimony for all the world to see.

Valentine & Company's New Varnish

on a chassis will remain in perfect condition for months after other varnishes have been ruined. Prove this varnish for yourself.

We have prepared small pieces of tin, varnished on one side with one of the best known automobile gear varnishes and on the other side with Vanadium Chassis Finishing Varnish. If this tin is left in a strong solution of soap—say a pound to the gallon—for thirty minutes the old-fashioned gear varnish will lose its lustre. Our Vanadium Chassis Finishing will remain unharmed.

This bath in a strong soap solution is equivalent to a month or more in the garage.

Write for this tin. Just fill out the coupon and we will send it to you at once with attractive descriptive booklets.

VALENTINE & COMPANY

456 Fourth Avenue
New York

343 So. Dearborn Street
Chicago

74 Pearl Street
Boston

V. C. F.

Cut off and mail to Valentine & Comp'y

Name

Address

City

State

Overland

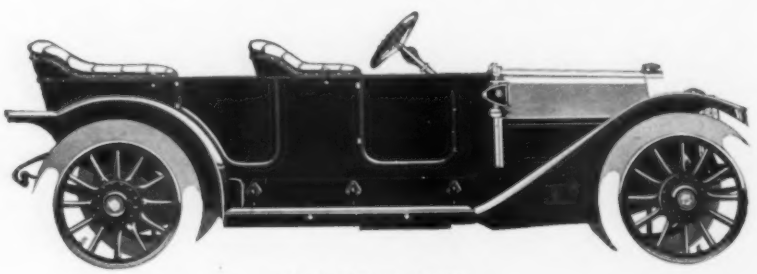
IF judged by the value received in the average forty-five horsepower five-passenger touring car our Model 61 will give you $1800 worth for $1500. It gives you everything that you get in the best of the other cars of this type and a little more than you can get in the average.

Take the specifications of our Model 61—line them up against any set of $1800 specifications and you will find them practically the same. And not only are the base specifications almost identical but the appearance, comfort, finish and general construction are equal.

If the $1500 Overland gets you about as much as you get in any other $1800 forty-five horsepower five-passenger touring car why should you pay the difference?

Send for our interesting catalogue. Ask for book N44.

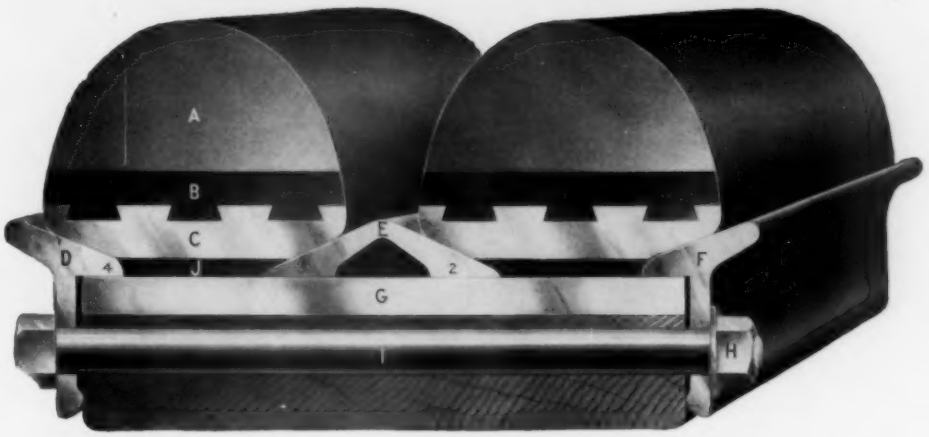
The Willys-Overland Co., Toledo, Ohio



Model 61-T—$1500

Wheel base, 115 inches; body, 5-passenger fore-door touring; motor, 4⅛x4½; horsepower 45; Bosch magneto; tires, 34 x 4 inch Q. D.; finish, Brewster green, ivory stripe, all bright parts nickel-plated; 3 black and nickel oil lamps; 2 black and nickel gas lamps. Price, $1500.

Solid Tire Efficiency



Cross Section View of The United States Standard Motor Truck Tire Demountable

The economic value of a motor delivery system depends very largely upon the efficiency of its tire service.

Obviously the first desirable quality in a truck tire is a big mileage-yielding capacity. Every owner knows that it is the actual wear in a tire that furnishes the foundation for computing expenses for tire maintenance.

Every owner also knows that no matter how great the mileage-yielding capacity of a tire may be, replacements occasionally are necessary. Then it is important that changes should be made in as short a time as possible.

Every hour a truck is out of service its owner is losing money

The UNITED STATES STANDARD MOTOR TRUCK TIRE

(Demountable)

has established standards of solid tire economy never before known.
It is guaranteed for 10,000 miles.
Changes can be made by the driver **anywhere** in fifteen minutes time or less.
The only tools required are an ordinary wrench, a hammer and your two hands.
Replacements of both single and dual tires can be made without removing the wheel from the truck.
Why don't you take advantage of this tire efficiency?
Write us for descriptive literature.

UNITED STATES TIRE COMPANY

New York

MACK

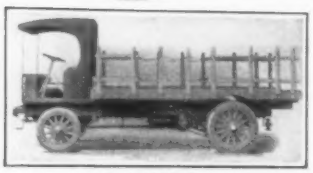
COMMER

SAURER

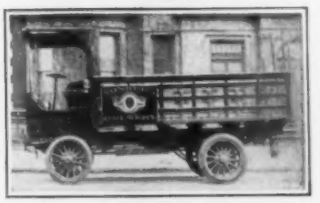
POLACK MOTOR TRUCK TYRES

Will prove conclusively by a few frank comparisons that they are incomparably the cheapest in use; the most resilient; the tyres which give the greatest amount of effective service under all conditions of usage.

Send for booklet and latest price lists.



GARFORD



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SAURER

PACKARD

GENERAL VEHICLE

POLACK TYRE COMPANY

Main Offices:

Ehret Bldg., Broadway and 59th St.
New York City

BRANCHES:

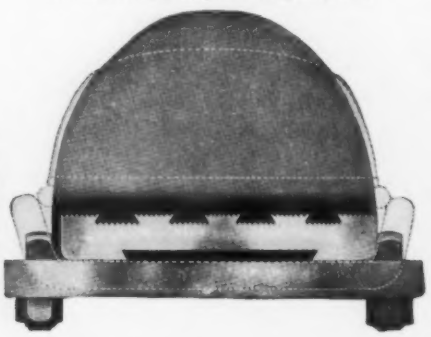
146 Summer St., Boston, Mass.
1004 Michigan Ave., Chicago, Ill.
247 Jefferson Ave., Detroit, Mich.
512 Mission St., San Francisco, Cal.
516 Parkway Building, Philadelphia, Pa.
505 Liberty Ave., Pittsburgh, Pa.
917 First Ave., So. Minneapolis, Minn.
930 South Main St., Los Angeles, Cal.

GRAMM

Try Polack Tyres on your Electrics and note the saving in current consumption.

Try Polack Tyres on your Gasoline Trucks and note the saving in repairs.

PIERCE-ARROW



COMMER

LANSDEN
ELECTRICS

with Edison Batteries

A Type and Size for Every Purpose

Delivery Wagons and Trucks of 750 Pounds to Five Tons Capacity

Operates at ⅓ less average cost than the Gasolene. Will outlast any 3 gasolene trucks with one-tenth of the interruption of service. Does not require a force of experts or a machine shop to operate and maintain.

It Is Good Business

to investigate a motor truck of which the owners of more than 700 say it makes the cheapest and surest deliveries. Some have been in service seven years.

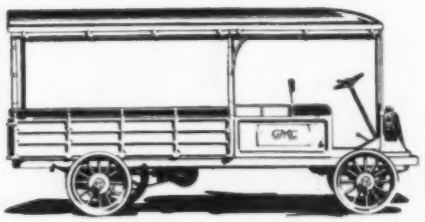
A Sure Proof That Lansden Trucks Are Best

One Express Company has over 100 Lansdens in use, purchased on 15 repeat orders. On February 1st, 1912, this same Express Company placed its 16th repeat order for 50 One, One and One-Half and Two-Ton 1912 Model Lansden Trucks,—representing a total investment of over $500,000.00.

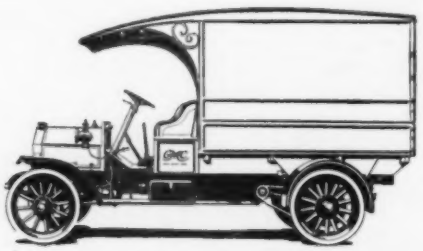
THE LANSDEN COMPANY, Newark, N. J.

The Oldest Company Engaged Exclusively in the Manufacture of Commercial Electric Vehicles

COMPLETE INSTALLATIONS — GASOLINE GMC ELECTRIC TRUCKS — COMPLETE SERVICE



ELECTRIC TRUCK—EXPRESS BODY
Model 3—3000 lbs. Capacity. Price, Chassis Only, $1700.
Batteries and Bodies Optional.



MODEL V—PANEL BODY
Gasoline—1 Ton Capacity. Price, Chassis Only, $2300.

Ability Stability Reliability

Those are the cardinal points that should determine the selection of motor trucks. The manufacturing *ability* which answers all question as to design and quality in construction. The *stability* of the organization which insures permanency of the manufacturer. The *reliability*—which guarantees satisfactory operation of the truck and careful service and co-operation.

GMC Trucks are the product of the unequaled facilities of General Motors Truck Company factories, complemented by an unexcelled engineering staff, and founded upon ten years' experience in the building of gasoline and electric commercial cars.

General Motors Truck Company, through its association with General Motors Company, gives assurance of permanence by ample capital, competent management, and the standing of its products. This manufacturing, engineering and financial strength and resources are behind every GMC Truck. Service, lasting, economical, and efficient, is thus guaranteed to every user.

A distinct service department is maintained for prompt repair, replacement, overhauling, adjustment or any other assistance needed by the GMC Truck owner to realize the fullest return from his investment.

This company is the only truck manufacturer making both gasoline and electric trucks. Our recommendations as to which power is better for any given work will be made without bias toward either gasoline or electricity. The GMC line comprises capacities of 1000 lbs. to 6 tons, and in gasoline models both the motor-under-hood and the motor-under-seat types. We are thus in a position to meet any requirement in motor transportation. We will make an analysis of your delivery problem without charge or obligation.

Correspondence from prospective purchasers and dealers is invited.

GENERAL MOTORS TRUCK COMPANY

DETROIT, MICHIGAN

Branches: New York, Chicago, Boston, Philadelphia, Kansas City, Detroit

THE VITAL QUESTION

in the adoption of commercial vehicles is

SERVICE PLUS LOW MAINTENANCE COST

Tires are the largest upkeep cost item

ARIES TRUCKS

(BUILT IN FRANCE)

are equipped with steel tired wheels (note illustration below), which wheels we guarantee to give

60,000 MILES SERVICE

The President of the Welz & Zerweck Brewery, Brooklyn, N. Y., writes us as follows:

"If our motor truck equipment in the beginning had been composed wholly of Aries steel shod trucks it would have saved us many thousands of dollars, as we have found by experience that the most important item of expense in the upkeep of trucks is rubber tires."

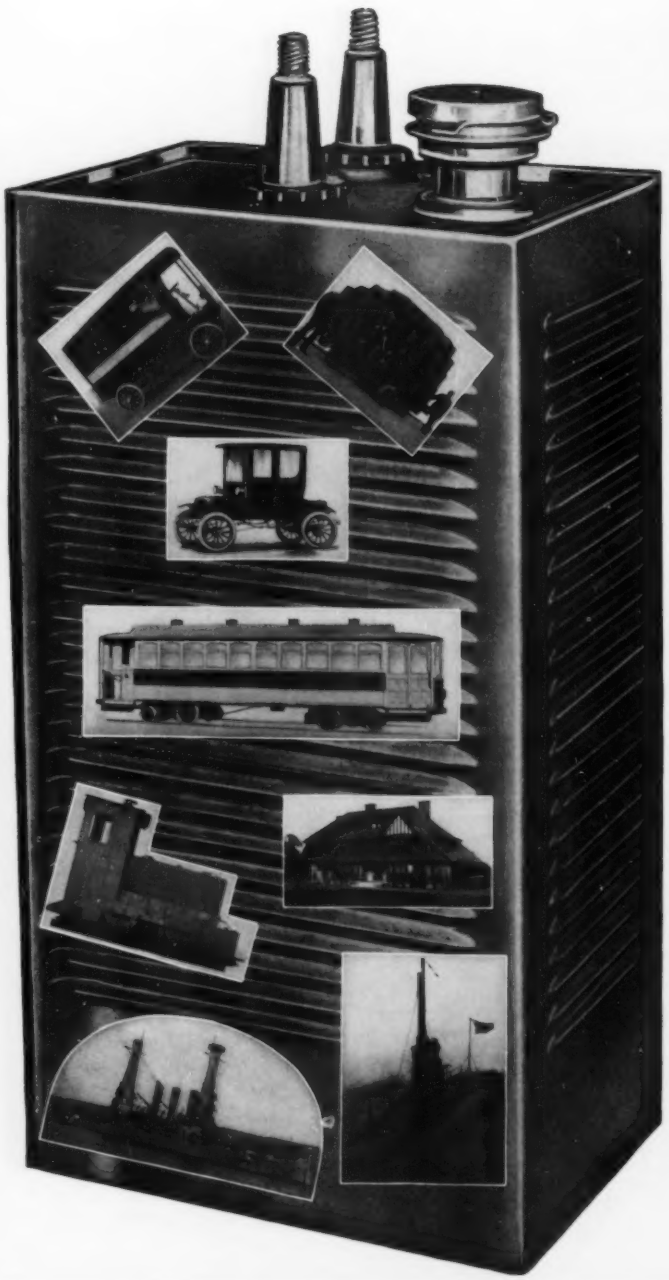
One of the Four Seven-Ton Aries Trucks in the Service of C. & J. Fanteuzzi, Puerto Rico

Investigate ARIES Trucks (types one to seven tons) before purchasing and be benefited by the experience of others

J. JACCARD & CO.

213 West 69th Street
NEW YORK CITY

The Edison



As great an advance in world progress as was the Edison Incandescent Lamp Tremendously superior to all other storage batteries because:

It embodies an entirely new and correct principle.

It is lighter and vastly more durable.

Excessive vibration and concussion do not affect it.

No damage done by prolonged and oft repeated overcharging.

No injury from remaining idle in a charged or totally discharged condition indefinitely.

Extremely small loss of charge while standing idle.

Contains no acid, therefore no acid laden gases evolved.

No injury to metal work from gases.

No personal discomfort from gases.

Short-circuiting does it no injury.

It maintains its capacity for many years.

Storage Battery

"Built like a watch but as rugged as a battleship"

No buckling or growing of plates.

No plate renewals.

No shedding of active material.

No sediment in jars.

No cleaning of jars.

No breaking of jars.

No sulphation or corrosion of parts.

No expert attention required.

It has changed the entire aspect of the electric pleasure vehicle situation.

It makes the electric truck a profitable investment by eliminating battery repair and renewals and insuring reliability.

It banishes unsightly trolley wires for street car propulsion.

It makes the electric locomotive a safe proposition in mines and powder mills.

It renders expensive railway terminal electrification unnecessary.

It changes taxicab operation from loss to profit.

It solves the train lighting problem.

It has added new life to country house lighting.

It practically doubles the strategic efficiency of the submarine and will outlast any boat in which it is installed.

It can be relied upon for power in emergency, for illuminating magazines and handling rooms, hoisting ammunition, operating turrets and laying guns.

It is dependable for sight lighting and gun firing, even if charged only once in six months, and is the only storage battery made that will stand up to concussion of gun fire.

It will operate your Klaxon horn one year on one charge; will light your car, run your ignition system, furnish power for your electric self starter and last for many years.

Manufactured in Sizes from 1 Ampere-Hour Portable to the 15,000 Ampere-Hour Submarine Types

We are running an interesting continued story on the Edison Storage Battery Development, Theory, Construction, and Application, in the advertising columns of the Army and Navy Journal, Journal of Commerce, Engineering and Mining Journal, Electrical World, Manufacturers' Record, Iron Age, Motor Age and the Automobile, by Miller Reese Hutchison, Chief Engineer and Personal Representative of Mr. Edison, beginning with the weekly issues published about March 1st, 1912. They are of general interest, judging from the widespread favorable comments we are receiving.

APPROVED:

Thomas A Edison

EDISON STORAGE BATTERY CO.
141 Lakeside Avenue
ORANGE, N. J.

Diamond
WIRE MESH BASE (SPLICELESS) TIRES

UNINTERRUPTED MILEAGE
is what makes the use of a motor truck profitable.

UNINTERRUPTED mileage depends as much on the tires used as on the truck itself. So the difference between expense and investment in the use of a motor truck is often largely a matter of wise tire buying.

Motor trucks equipped with Diamond Wire Mesh Base Spliceless Tires are not an expense, but are, as a rule, an investment because of insured uninterrupted mileage.

Six years of constant use has proved that Diamond Wire Mesh Base Spliceless Tires as originally designed were correct in principle. Though the truck tire industry has seen many changes there has been brought to light nothing to warrant the slightest change of principle in Diamond Wire Mesh Base Tire construction.

The thoroughness that has made Diamond Pneumatic Tires the largest selling single brand of tires in the world for fourteen years, has also made the Diamond Wire Mesh Base Spliceless Tire the largest continuously used make of solid truck tire since its correct principle was worked out by Diamond engineers.

There are 54 Diamond Service Stations equipped to take care of Truck Wheels quickly and efficiently, insuring the users of tires uninterrupted mileage.

The Diamond Rubber Company

Akron, Ohio

MAY WE HAVE YOUR LAYOUT

OF BEARING INSTALLATION?

We can save you money, time and trouble,—in other words, show you a short cut to satisfactory bearing installation.

The successful use of New Departures in 60% of the motor cars manufactured in this country proves that the quality of this American-made bearing has been well established.

This fact also constitutes a good reason why you should send us your layout and give our engineering and sales departments an opportunity to place our proposition squarely before you.

Our engineering department is highly specialized, not only for the production of superior ball bearings, but for giving to the trade expert co-operative service.

THE NEW DEPARTURE MFG. CO.

BRISTOL, CONN.

1016 FORD BLDG., DETROIT, MICH.

FIRST LOAD OF LUMBER
to be delivered to
Panama-Pacific Exposition Grounds
1915
Furnished by SAN FRANCISCO LUMBER CO.
hauled by FEDERAL 1 TON TRUCK

The Federal truck hauling the first load of materials for the Panama Exposition in San Francisco

Federal One-Ton Truck Chassis, including seat, $1800. Body type at purchaser's option. Wheelbase, optional, 110 inch or 144 inch; Motor, 4 cylinder, 30 horsepower; Magneto, high tension; Clutch, 16-inch cone; Transmission, three speeds forward and reverse; Timken bearings in wheels; Tires, solid, 36 x 3½ inch front—36 x 4 inch rear.

The Pioneer of Progress as Usual

The Federal

This is the extraordinary recognition that has come to the Federal One-Ton Truck. In Efficiency, Reputation and Price the Acknowledged Leader.

When the Federal one-ton truck sold for $2200, it led all standard one-ton trucks.

When the price of the Federal was reduced to $1800, it gave the Federal an advantage of from $400 to $500 over all other standard one-ton trucks of the Federal's rating.

It gave the Federal a start of one year on all worthy competitors; for where other one-ton trucks will be a year hence, the Federal is today.

It put from $400 to $500 into the pocket of the discriminating manufacturer who had already recognized in the Federal one-ton truck the standard of efficiency, reliability and economy in his delivery and trucking problems.

The demand for Federal trucks doubled in two weeks following the announcement of the $1800 price.

To meet that demand the Federal moved into a new factory with vastly increased capacity.

Today the demand for Federal trucks is treble that of a year ago.

That astonishing price, $1800, is possible now—

Because we buy materials in enormous quantities;

Because we are specializing and concentrating all the energy, engineering skill and capacity of our factory and the huge momentum of our success in the new Federal one-ton truck. All our success goes back into the Federal.

The Federal is the first and only one-ton truck to guarantee a maximum of service and quality for a minimum of investment and upkeeping cost.

That Is the Reason—

The Federal Model C—110 inch wheelbase, with its short turning radius, its strong, compact body, its great power, its infallible reliability—now dominates the field of city trucking.

Federal Motor Truck Co., Detroit, Mich.

New Factory, Dept. A **Leavitt & Campbell Aves.**